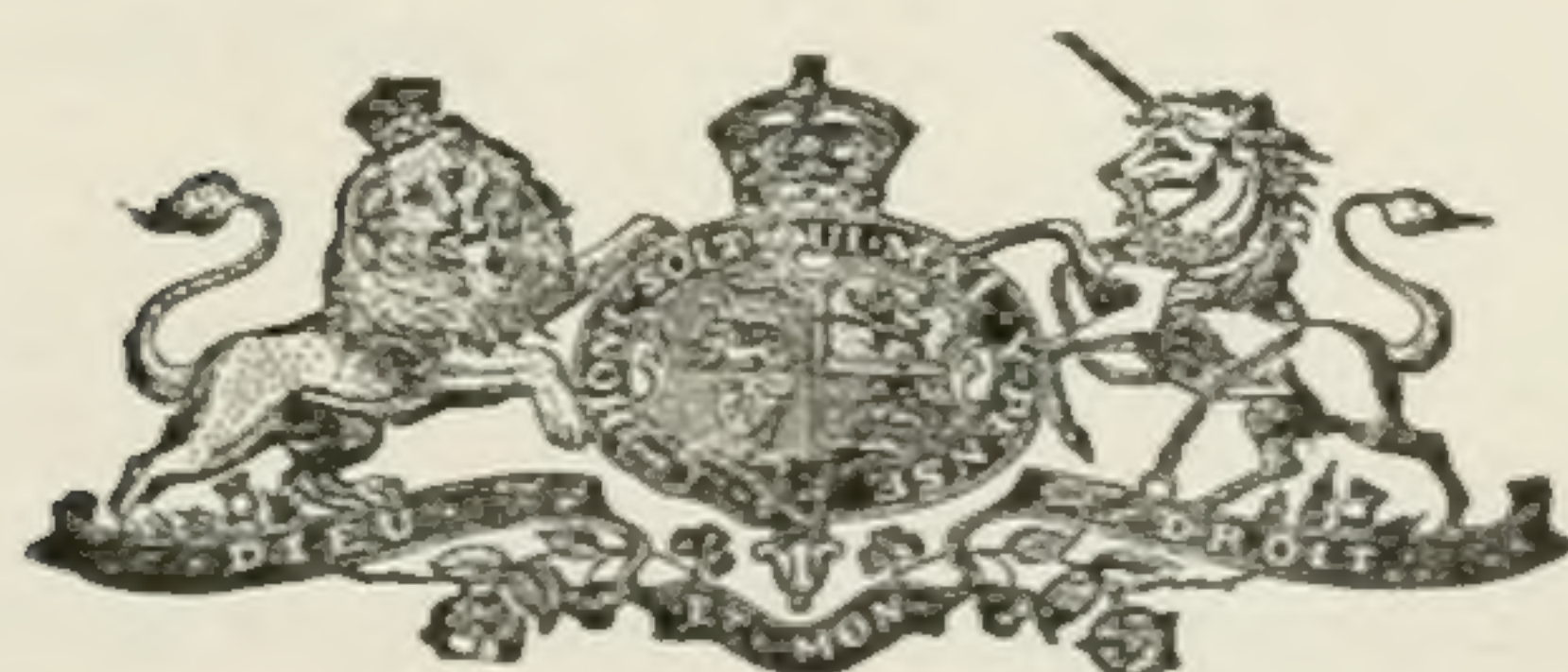


REPORT
OF THE
INTERNATIONAL WATERWAYS
COMMISSION
ON
THE REGULATION OF LAKE ERIE
WITH A
DISCUSSION OF THE REGULATION OF THE
GREAT LAKES SYSTEM
TOGETHER WITH
APPENDIX, TABLES AND PLATES

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REPORT
ON
REGULATION OF LAKE ERIE.

INTERNATIONAL WATERWAYS COMMISSION.

OFFICE OF AMERICAN SECTION,

BUFFALO, N.Y., JANUARY 8, 1910.

1. The act of the Congress of the United States, approved June 13, 1902, which requested that the Government of Great Britain be invited to join in the formation of this Commission, defined one of the duties of the Commission as follows, viz.:

"The said Commissioners shall report upon the advisability of locating a dam at the outlet of Lake Erie, with a view to determining whether such dam will benefit navigation, and if such structure is deemed advisable, shall make recommendations to their respective Governments looking to an agreement or treaty which shall provide for the construction of the same, and they shall make an estimate of the probable cost thereof."

2. The Great Lakes, lying between the United States and Canada, with their connecting channels and their natural outlet to the sea, the St. Lawrence River, of which a description will be found in the appendix to this report, constitute the most important system of inland navigation in the world. The traffic which passed through the Detroit River, its busiest link, in 1907, amounted to 71,226,895 tons, valued at about \$700,000,000. About 70 per cent. of this traffic is carried in large freight carriers which are loaded down to the greatest draft that can be carried into the harbors or through the channels between the lakes. With the depth now available they are usually loaded to a draft of about 19 feet, but careful watch is kept upon the stage of the waterways and advantage is taken of any temporary increase of stage to load the vessels deeper. The number of deep-draft vessels, as well as their size, and the share of lake traffic which they carry is increasing each year, while the lake traffic itself is increasing with great rapidity. Vessels which would carry an additional load of 85 tons for each inch of additional draft have recently been added to the fleet. Every inch added to the available depth of water would therefore, be of material benefit to commerce.

3. The method heretofore employed for deepening the natural channels is that of excavation, but it has been suggested that a more economical and otherwise better method would be to raise the surface of the water by obstructing the flow of the outlets. For Lake Erie in particular a definite plan, with estimates of cost, was proposed by the Board of Engineers on Deep Waterways in their report dated June 30, 1900, published as House Document No. 149, Fifty-sixth Congress, first session. The official character of this report and the ability displayed in its preparation seem to have led to the provisions of law under which this Commission is now acting, and to make of it a proper starting point for this discussion. It was proposed by the Board to "regulate" the level of Lake Erie.

4. By the term "regulation of a lake's level" is meant the maintenance of its level at or near some fixed stage, which implies such control of the discharge as will make the latter nearly equal to the total supply—rainfall and inflow less evaporation—at all times. In some cases, this may be accomplished by a submerged weir in the outlet, of such length that a small increase or decrease of stage will increase or decrease the discharge over the weir by an amount equal to

the change in the total supply. A work of this kind operates automatically, but manifestly it requires more or less range of stage and the topography must be such that a great length of weir can be found; it does not lend itself to the most complete regulation.

5. The works proposed by the Board were for the regulation of Lake Erie within a range so small that it might be considered almost complete regulation. They consisted of a submerged weir in connection with a set of sluice gates “so designed that with the sluice gates all closed the low-water flow of the regulated stage of the lake will be discharged over the fixed submerged weir, and with the sluice gates all open the additional volume of overflow necessary to maintain the lake at nearly the same level will pass through the sluices at times when the lake is receiving its maximum supply.” They were to be placed near the angle in the Bird Island Pier, at the head of Niagara River, and were designed to hold the level of the lake at or near 574.5, old levels, or 574.7, 1903 levels, above mean tide at New York. This is higher than any monthly mean stage reached since authentic records have been kept, that is, since 1860. It was a maximum not to be exceeded. It is not definitely stated what the minimum monthly stage would be under regulation, but it may be inferred from certain paragraphs in the Board’s report that it was to be about 573.7, 1903 levels. (See paragraph 104 of the appendix.)

6. The Great Lakes constitute a series of enormous natural reservoirs, each of which serves to regulate the flow in the river constituting its outlet, and to maintain the lake below. They are inter-dependent. The study of one, to be complete, must include the study of all. The total area drained by them is about 287,688 square miles, an area considerably larger than the German Empire. Of this total, about one-third is occupied by the lakes themselves, that is, is devoted to reservoir purposes. The result is a uniformity of level and a uniformity of flow which is truly wonderful. In Table A are given the areas of the lake surfaces and of the drainage basins.

TABLE A.

LAKE	AREA OF LAKE SURFACE IN SQUARE MILES.	DRAINAGE AREA, INCLUDING LAKE SURFACE IN SQUARE MILES.	RATIO OF LAKE TO DRAINAGE AREA.
Superior.....	32,060	76,134	1: 2.37
Michigan.....	22,336	65,799	1: 2.95
Huron.....	22,978	72,008	1: 3.13
St. Clair.....	503	6,194	1: 12.31
Erie.....	9,968	34,573	1: 3.47
Ontario.....	7,243	32,980	1: 4.55
Total.....	95,088	287,688	1: 3.02

Authority: 1906 U.S. Lake Survey report.
The areas of the small lakes and streams are taken as a part of the land area.

In Table B are given the average and the extreme variations in the levels during the period from 1860 to 1907.

TABLE B.

	SUPERIOR.	HURON.	ERIE.	ONTARIO.
	feet	Feet	Feet	Feet
Extreme range 1860-1907.....	3.32	4.64	3.89	5.54
Maximum range in 1 year.....	(1869) 2.67	(1876) 1.94	(1892) 2.28	(1867) 3.65
Minimum range in 1 year.....	(1891) 0.49	(1879) 0.59	(1895) 0.87	(1907) 0.79
Average annual range.....	1.18	1.21	1.56	1.93

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In Table C are given the average and the extreme variations in the discharge of the outlets for the period 1860 to 1907:

TABLE C.

	ST. MARYS RIVER	DETROIT RIVER.	NIAGARA RIVER.	ST. LAWRENCE RIVER AT ITS HEAD.
Average discharge for entire period.....	82,000 c.f.s.	204,200 c.f.s.	212,200 c.f.s.	254,400 c.f.s.
Greatest excess average for any one month.....	46,700 Sept., 1869. 57%	71,200 July, 1883. 35%	45,600 June, 1876. 21%	96,800 May, 1862. 38%
Greatest excess average for any one year.....	19,100 1876. 23%	30,200 1885. 15%	26,500 1876. 12%	49,000 1862. 19%
Greatest deficiency average for any one month.....	33,800 Feb., 1893. 41%	98,900 Feb., 1874. 48%	43,500 Mar., 1896. 20%	102,200 Feb., 1902. 40%
Greatest deficiency average for any one year.....	16,900 1879. 21%	30,600 1896. 15%	31,800 1895. 15%	62,800 1895. 25%

No work of man ever has approached or ever will approach this perfection of regulation. The question now is, can he add to that which exists in any important degree?

7. Evidently the answer to this question must be based upon careful analysis and close computation. The data for its solution are found in the records of the water levels, and in the measurements of discharge taken during the last 48 years, principally under the direction of the Chief of Engineers, U.S. Army. Actual values assigned to rainfall and evaporation are not well determined and cannot be used. It is the relative value of these elements which it is necessary to know, and that value is found in the discharge measurements.

8. Soon after the organization of the Commission, a committee of two of its engineer members was appointed to collect all of the available data, and to make an hydraulic analysis of the general regulation of all the lakes. It was well known at the outset that this would be a long and laborious task, but it proved to be more so than was expected, and it was only recently completed. The full report of the committee is hereto attached as an appendix. A brief synopsis of it is here given.

9. Beginning about 1860, and continuing to date, daily or tri-daily water-level observations have been taken at Marquette on Lake Superior, Milwaukee on Lake Michigan, Cleveland on Lake Erie, and Oswego and Charlotte on Lake Ontario. Beginning at later dates, observations have been taken at Sault Ste. Marie, Harbor Beach on Lake Huron, St. Clair River, St. Clair Flats Canal, Windmill Point on Lake St. Clair, Amherstburg on Detroit River, Buffalo on Lake Erie, Ogdensburg on St. Lawrence River, and Lock 27 at the head of Galop Rapids, Lock 24 at the head of Rapide Plat, and Lock 21 at the head of Long Sault Rapids, on St. Lawrence River. Self-registering automatic gages giving a continuous graphical record of the rise and fall of the water, were not installed until 1899. The record for each of the above-mentioned gages, except the last two, from 1860 to 1907, inclusive, has been completed by interpolation. For Lock 24 on the St. Lawrence, the record has been completed from 1880, and for Lock 21, from 1870. There are a few isolated records of dates earlier than 1860, but they are not well authenticated and cannot be used here.

10. As was stated in our report of January 4, 1907, upon the Chicago Drainage Canal, "Variations in the level of the lake's surface, due to winds and to change of barometric pressure, are frequent and irregular and at times

violent. Variations of more than 6 inches are very common, often occurring hourly for many hours in succession, while variations of 2 or 3 feet within an hour are not uncommon. Besides these irregular variations there is a regular annual variation due to difference in rainfall, evaporation, and run-off, the water level being highest in midsummer and lowest in midwinter. The levels are affected also by the greater or less severity of the winter and by the consequent greater or less decrease in the discharging capacity of the outlets by ice. In order to study the annual oscillations it is necessary to eliminate the irregular oscillations, and that is accomplished by using the average levels for a month." The monthly mean stage has been obtained by taking the average of the gage readings for a month, and is given for each of the above-mentioned gages in Tables 2-17. The monthly mean stages of Lakes Superior, Michigan-Huron, St. Clair, Erie, and Ontario, from 1860 to 1907, inclusive, are shown on Plate 1.

11. The volume of discharge of the outlet at any given stage is obtained from a formula deduced from actual measurements of discharge at such stages as happened to exist at the time of observation. Formulæ of this kind were deduced for each of the outlets of the Great Lakes. During the winter of 1896 discharge measurements of the St. Marys River, the outlet of Lake Superior, were made at Spry's Dock Section, located about a mile below the St. Mary's Rapids. In 1902 discharge measurements of the same stream were made at the International Bridge which connects Sault Ste. Marie, Mich., with Sault Ste. Marie, Ontario. In 1905 similar measurements were made at "Section Brewery," located about 2,000 feet below Spry's Dock Section. All of these observations were made by the U.S. Lake Survey. Up to the year 1887, the discharging capacity of the St. Marys River remained nearly uniform. Since that date, numerous artificial works have been constructed at the Sault, which have modified its discharging capacity to an important degree. During the years 1887 and 1888, the International Bridge was built, which with its piers and approaches materially reduced the cross section. In 1892, the Edison Sault Electric Company placed power works in the bed of the stream. In 1895, a power canal on the Canadian side was opened to use. In 1905, a power canal on the Michigan side was opened to use, compensating works in connection therewith having been placed in the river in 1901 and 1902. The amount of water diverted by the power canals has increased from time to time since they were opened, and so has the quantity used by the American and Canadian locks. To conform to these changes it was necessary to deduce eleven different discharge formulæ for the St. Marys River alone.

12. The discharge formula for St. Clair River, the outlet of Lake Michigan-Huron, was deduced from observations made by the U. S. Lake Survey in 1899, 1900, 1901, and 1902. In 1900, the Chicago Drainage Canal began diverting water from Lake Michigan. The amount diverted between January, 1900, and June, 1904, inclusive, was computed from data furnished by the U. S. Engineer Office at Chicago. The flow through the canal since June, 1904, has been assumed to be 4167 cubic feet per second, the quantity authorized in the permit of the Secretary of War. It is believed to have been greater, but the difference is not sufficient to vitiate the results sought for here. An application by the Commission to the Sanitary District of Chicago for a copy of their record met with a refusal to furnish it.

13. The discharge formula for the Detroit River was derived from measurements taken at Fort Wayne, Michigan, by the U. S. Lake Survey in 1901 and 1902.

14. For the Niagara River, the outlet of Lake Erie, discharge measurements were made at the International Bridge at Buffalo, and at a point about 1,800 feet down stream, called the "Open Section." These observations were begun

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in 1897 for the Board of Engineers on Deep Waterways, and were continued in 1898, 1899, and 1900, by the U. S. Lake Survey.

15. The discharge formula for the St. Lawrence River, the outlet of Lake Ontario, was deduced from measurements made by the U. S. Lake Survey in 1901 and 1902 at "Three Points Section," situated about 15 miles below Ogdensburg, N.Y., and 9 miles below the head of the Galop Rapids.

16. With the discharge formulæ and the gage records, the average discharge in cubic feet per second, has been computed for each month from 1860 to 1907, inclusive, for each outlet. The results for St. Marys River are given in Table 19; those for Detroit River in Table 20; those for Niagara River in Table 21; and those for St. Lawrence River at its head in Table 22.

17. The total supply of water to a reservoir or lake depends upon the inflow or transmitted supply from another watershed, the precipitation on the surface of the lake, the run-off from the lake's watershed, and evaporation from the lake's surface, or the outflow from and storage in the lake. Of these factors, for the Great Lakes, the transmitted supply, the discharge, and the storage are known separately, while the value of precipitation, run-off, and evaporation is known collectively. The local supply for any lake is the water-yield from its own watershed, and is equal to the total supply minus the transmitted supply or inflow from the watersheds situated above. The supply factors have been deduced for Lakes Superior, Michigan-Huron, Erie, and Ontario, for each month from 1860 to 1907, inclusive, and the results are given in Tables 24, 25, 26 and 27. They are shown graphically upon Plates 2 to 17 inclusive.

18. It is to be noted that minus values for the monthly mean local supply have frequently occurred, that is to say, the evaporation has frequently exceeded the precipitation and run-off. For Lake Superior, minus values occurred at some time during 41 of the 48 years considered; this usually happened in December, but it sometimes occurred in each of the months from October to April, inclusive. The greatest minus value occurred in December, 1870, when the evaporation exceeded the precipitation and run-off by 106,600 cubic feet per second.

19. For Lake Michigan-Huron, minus values occurred in 33 out of the 48 years considered. This usually happened in September, October, or November, but it sometimes happened also in August and December. The greatest minus value occurred in September, 1871, when the evaporation exceeded the precipitation and run-off by 125,700 cubic feet per second. In that year minus values occurred in each of the four months from August to November. In 1894, minus values occurred from August to December, inclusive.

20. For Lake Erie, minus values occurred with extraordinary frequency. They are found in every year, and, in many years in all of the last six months. From June, 1884, to March, 1885, inclusive, that is, for 10 consecutive months, evaporation exceeded precipitation and run-off continuously, the average excess for the entire period being 40,400 cubic feet per second. There is no month, except the month of May, in which a minus value has not been found in some year between 1850 and 1907. The excessive evaporation in Lake Erie may be attributed to the facts that the lake is shallow and its longer axis lies in the direction of the prevalent winds.

21. For Lake Ontario, minus values occurred less frequently than with the other lakes, but were found in 27 out of the 48 years. The greatest minus value occurred in January, 1877, when the evaporation exceeded the precipitation and run-off by 40,300 cubic feet per second.

22. To obtain the general law which governs these supply factors, Table 28 was prepared, which gives their average for the entire period from 1860 to 1907. The averages for Lakes Superior, Michigan-Huron, Erie, and Ontario are shown graphically on Plate 18. From these, it appears that evaporation exceeds the local supply in Lake Superior during December and is nearly equal to it during January; that evaporation is nearly equal to the local supply in Lake Michigan-Huron during October and November; that it exceeds the local supply in Lake Erie during the last half of the year, July to December; and, as a general rule, does not exceed the local supply in Lake Ontario.

23. The maximum stage of one lake does not occur at the same time as that of another lake, and this is true also of the minimum stage. Nor does the maximum outflow occur at the time of the maximum total supply, nor the minimum outflow at the time of the minimum total supply. The lake may continue to fall while the supply of water is increasing and *vice versa*. These great forces require time to act. The following table shows the ratio, R, between the maximum discharge and the maximum total supply for each lake, the time interval, T_{MAX.}, which elapses between the maximum total supply to any lake and the maximum discharge from that lake, and the time interval, T_{MIN.}, which elapses between the minimum total supply and the minimum discharge

LAKE	R	T _{MAX.}	T _{MIN.}
Superior.....	0.524	98 days	91 days
Michigan-Huron.....	0.647	82 "	101 "
Erie.....	0.884	76 "	132 "
Ontario.....	0.955	56 "	20 "

From which it is to be inferred that the interval of time required for an increasing supply to show its effect upon the level of Lake Superior is about 98 days, and for a decreasing supply it is about 91 days; in Lake Erie, the corresponding intervals are 76 days and 132 days respectively; for the other lakes, the intervals are somewhat less.

24. With the data which have been given, it is now possible to show what the practical result will be of an attempt to regulate the level of any lake within any given limits. For illustration, the Commission has selected the regulation of Lake Erie, between the limits 573.7 and 574.7, 1903 levels, by means of a submerged weir and sluice gates, as proposed by the Board of Engineers on Deep Waterways. In this case, the sluice gates cannot be set daily or at frequent intervals, to meet conditions as they arise, because of the difficulty of ascertaining what the true level of the lake is and what its consequent discharge is at any particular time. The irregularity and occasional violence of its oscillations make it necessary to take the average of a considerable number of observations—usually those of a month—to find the true level. The gates can, therefore, be set not oftener than once a month, and then only approximately. It is necessary to fix upon some definite elevation for the stage of the lake at the beginning of each month and then to set the sluice gates to give a discharge which will bring the lake to the level desired at the end of the month. That is to say, it is necessary to estimate the total supply which the lake will receive during the month to come. For regulation between the levels 573.7 and 574.7, the stage values at the beginning of each month should be approximately as follows:

January 1.....	573.8	May 1.....	573.9
February 1.....	573.7	June 1.....	574.0
March 1.....	573.7	July 1 to November 1.....	574.0
April 1.....	573.8	December 1.....	573.9

In Table 33 are given the actual supply to Lake Erie, and the supply which would have been estimated if regulating works had been in operation for each

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month from January, 1890, to December, 1906, inclusive, and their difference. The table gives also the level which the lake would have reached with regulating works, and the difference between the stage reached and the stage desired. The actual supply and the stage are rarely identical with those expected, and in some cases the differences are important. For example, the actual supply in March, 1891, was 37,100 cubic feet per second less than would have been estimated, and in the following month, April, 1891, it was 47,800 cubic feet less than would have been estimated; the stage reached at the end of April, 1891, would have been 573.48, or 5 inches lower than the stage desired. In April, 1892, the supply was 40,200 cubic feet per second, and in the following month it was 29,400 cubic feet per second, more than would have been estimated, and the stage reached at the end of May would have been 574.54, or about $6\frac{1}{2}$ inches higher than the stage desired. In July, 1892, the actual supply was 35,300 cubic feet per second less than would have been estimated. In June, 1893, the actual supply was 39,000 cubic feet per second less than would have been estimated, and in June, 1901, was 32,300 more. Numerous other instances of important differences will be found in the table. They may occur in any part of the year. They show that it is not possible to foretell the stage under regulation, a month in advance, within 5 or 6 inches; that is to say, that a margin of about 6 inches must be allowed at the upper and lower limits proposed for regulation. If the attempt be made to regulate within a range of one foot, with this margin, there will be no range left for setting the sluice gates, which is absurd. In other words, the regulation of Lake Erie within a range of 1 foot, or between the limits 573.7 and 574.7, is impracticable.

25. It appears, however, from a study of Table 33, that it would have been possible during the period covered by the table, 1890 to 1906, to regulate the level of the lake between the limits 573.31 and 574.74, or within a range of about 18 inches. This period covers the extreme low-water year, 1895, but not an extreme high-water year, like that of 1876. Computations were made to ascertain the effect of regulation between the limits 572.0 and 574.5 in the two extreme years. The results are given in Table 35, and are shown graphically on Plate 21. It is found that the extreme range from high water of 1876 to low water of 1895 which was 3.78 feet, would under regulation have been reduced to about 2.5 feet. The high levels of 1876 would not have been raised, but the low levels of November and December, 1895, would have been raised 1.38 and 1.37 feet, respectively, and the annual mean level of 1895 would have been raised about 1.07 feet. This would benefit Lake Erie, and is, therefore, worthy of examination.

26. It must not be forgotten that these numbers refer to monthly mean or annual mean stages. It sometimes happens that the stage varies as much as 7 or 8 feet in one day, and more than 2 feet in one hour. Storms raise the water level, at Buffalo, several feet higher than normal, and lower it, at Amherstburg, by a like amount; the difference of level between the two ends of the lake in extreme cases having been as great as 15 feet. To control these irregular variations is impossible. It is possible only to regulate the monthly mean stage within the limits of about 2.5 feet. Whether or not it will be expedient to undertake the regulation of Lake Erie between these limits must depend upon the following considerations.

27. EFFECT UPON LAKE ERIE. An examination of Plate 21 shows that for a year of excessive supply, such as 1876, the regulation of Lake Erie would not improve navigation. In 1895, a year of deficient supply, the mean level during the eight-month season of navigation would have been raised from 571.31 under natural conditions to 572.41 under regulated conditions, and navigation would have been improved by an increase of 1.1 feet in the stage. The extreme low stages for the navigation season would have been raised at

least 1 foot without appreciable increase in the extreme high stage. This is equivalent to deepening every harbor and channel in Lake Erie by that amount.

28. **EFFECT UPON LAKE ST. CLAIR.** The increase in the stage of Lake Erie will decrease the mean slope in the Detroit River, and will cause Lake St. Clair to rise, until the slope be so far restored as to give to the discharge through the Detroit River a value equal to the natural discharge. The amount which Lake St. Clair will rise on account of an increase of 1 foot in the stage of Lake Erie, is computed to be 0.61 foot. (See paragraph 121 of the Appendix.)

29. **EFFECT UPON LAKE MICHIGAN-HURON.** As backwater from Lake Erie raises the level of Lake St. Clair, so backwater from Lake St. Clair raises the level of Lake Michigan-Huron. The effect of an increase of 0.61 foot in the stage of Lake St. Clair is to raise the level of Lake Michigan-Huron 0.27 foot. (See paragraph 123 of the Appendix.)

30. **EFFECT UPON LAKE ONTARIO, AND THE ST. LAWRENCE CANALS.** Any change in the outflow of Lake Erie will change the water levels of Lake Ontario. If the inflow to Ontario is increased, the lake level will rise, and with decreased inflow the level will fall. For the extreme years, 1876 and 1895, the effect upon Lake Ontario of the regulation of Lake Erie is shown in Table 36, and on Plate 21. For the high water year, 1876, there would have been but little change; at no time during the year would the regulated stage of Lake Ontario differ from the actual stage more than $1\frac{1}{2}$ inches. In 1895, the low water year, the oscillation would have been increased. The high water of May would have been about 1 inch higher, while the low water of September, October, and November, would have been 4.08, 4.46, and 4.00 inches, respectively, lower under regulation than under the natural conditions. To lower the level of Lake Ontario is to lower the St. Lawrence River and to injuriously affect navigation in the St. Lawrence canals. A comparison of the gage records upon Lake Ontario and at these canals shows that a fall of 4.56 inches in the level of Lake Ontario will lower the level in the Galop canals about 4.56 inches, in the Morrisburg canals by about 6.65 inches, and in the Iroquois Canal, Lock 25, by about 7.66 inches. During periods of low-water it would be necessary to diminish the draft of vessels navigating the canals about 7.66 inches, by decreasing their loads.

31. **EFFECT UPON NIAGARA RIVER.** The effect upon Niagara River would not be important. The stage would not fluctuate through any greater range than under natural conditions. During the winter months, more frequent low water would probably occur, in which case the power companies at Niagara Falls would probably have more difficulty in keeping the channels to their intakes free from ice. During the autumn months navigation might be slightly injured by the prolongation of the low-water season, due to the storage in Lake Erie of a part of the natural discharge.

32. **EFFECT UPON THE CITY AND HARBOR OF BUFFALO.** Low-lying portions of the City of Buffalo and the adjacent territory are subject to overflow both from the lake and from tributary streams, especially Buffalo Creek. Floods from the lake are due to storms blowing from the southwest. During the severe storm of January 20, 1907, Lake Erie rose to 579.45, or 6.49 feet above the mean for that month, or 7.0 feet above the mean of the preceding and following months. Iron furnaces were extinguished, a pumping plant was seriously crippled, and much damage was inflicted upon the lands and property in Buffalo adjacent to the lake and to Buffalo Creek. Under regulation, the monthly mean level of the lake upon that occasion would have been about $2\frac{1}{2}$ inches higher than it was and the height of the flood would have been increased by that amount. Floods from Buffalo Creek are now of common occurrence. With

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a few days of warm weather in the winter, the discharge of the creek becomes so great as to overflow its banks, and the water sometimes floods an area of 1,600 acres, having a population of 10,000. It is stated by the Department of Public Works of Buffalo that a rise of 2 feet in the stages of the lake causes a rise of about 1 foot in Buffalo Creek in the center of the flood district. Most of the floods in Buffalo Creek occur during January, February, and March, when Lake Erie is at its lowest stage. Some of the greatest floods have occurred during the extreme low-water periods, such as those in the winters of 1896, 1898, 1900, and 1902. With the winter level regulated at a height greater than it actually was upon those occasions, the flood height would have been increased, and greater damage would have occurred.

33. ICE JAMS. During every winter ice jams form on Horseshoe Reef at the head of Niagara River. The ice in the lake is blown toward the outlet by a southwest wind, and is piled upon the shallow reef, where it forms an ice jam extending from near the bottom to several feet above the surface of the water. In some instances, the bergs have been 20 to 30 feet high. The proposed regulating works, being placed about a mile below Horseshoe Reef, would aggravate this difficulty. The neck of the outlet might become so effectively blocked with ice that the flow of the river would be materially decreased as was the flow of the St. Clair River in the winters of 1901 and 1902. If those conditions should exist, a severe southwesterly storm, such as has occurred on numerous occasions, would inundate the lower part of Buffalo. These ice jams seriously interfere with navigation. The average date of opening navigation in the spring, at Buffalo, is April 9, while at Cleveland, the average date is March 23. The difference of 17 days in the dates of opening the two Lake Erie ports is due to ice jams. It is probable that it would be materially increased by the construction of the regulating works. It is to be observed that the ice jams would make it difficult to maintain the works.

34. EFFECT UPON THE LOW-LYING SHORES OF LAKE ERIE. There are low-lying portions of the shores of Lake Erie where the water is shut out by dykes and where pumping is now required. To raise the level of the lake would increase the amount of such pumping. It is possible, also, that there are points other than Buffalo, where great commercial interests are concentrated, and where local drainage is deficient, but for reasons which will appear presently it has not been considered necessary to make a detailed investigation of every locality.

35. The advantages then of regulating Lake Erie, between the limits 572.0 and 574.5, are that the low-water stages of Lake Erie will be raised about 1 foot; those of Lake St. Clair will be raised about 0.61 foot; and those of Lake Michigan-Huron, about 0.27 foot; without in any case increasing the high water stage.

36. The disadvantages are that the oscillations in Lake Ontario are increased about $5\frac{1}{2}$ inches, and low water is made lower by about $4\frac{1}{2}$ inches; that the depth in the St. Lawrence canals will be diminished by about 7.66 inches; that the city of Buffalo and its southerly suburbs will suffer by increased damage from floods, and from a postponement of the date of opening navigation in the spring.

37. In weighing these advantages and disadvantages, it is to be remembered that the persons who are to benefit by the former are not identical with those who are to suffer from the latter. Those navigating the St. Lawrence canals are not specially concerned with deepening the harbors of Lake Erie; nor are those occupying the low-lying portions of Buffalo sufficiently compensated for the injury to their property by the beneficial effects upon navigation. If the advantages and disadvantages could be equally distributed, we are inclined to think that the former would outweigh the latter, and that the expediency

of the undertaking would be a question of cost. As the matter stands, it involves the question of damages to vested rights, which in this case is peculiarly intricate. It is our opinion that the advantages are not of such overwhelming character as to justify the two governments in entering upon that vexatious question, and we therefore recommend that the "regulation" of Lake Erie be not undertaken, meaning thereby the most complete practicable regulation such as can be secured by a dam and sluice gates located at or near Buffalo.

38. It does not follow that nothing can advantageously be done to improve or maintain the level of the lake. It is possible to raise the level of any lake by simply reducing the size of the outlet. With a reduced cross section, the outlet requires a steeper slope, and the average level of the lake is raised, but the oscillations will go on as before, and the discharge will remain the same. To raise the level of Lake Erie will raise also, but to a less degree, the levels of Lake St. Clair and of Michigan-Huron, and will thus benefit those waters, while it will have no effect upon Lake Ontario or the St. Lawrence River. It would be physically practicable to raise the level many feet, but here again vested rights must be considered, and the amount which the level should be raised is in our judgment limited to that which will not interfere with those rights.

39. It is believed that somewhere in the Niagara River, between Lake Erie and the Falls, a submerged dam may be placed which will greatly benefit the navigation of the waters above without injury to those below and with only minor damages, if any, to the adjoining lands. Without any attempt to "regulate" Lake Erie, the level of the lake may be raised sufficiently to compensate for the damages heretofore inflicted by the Chicago Drainage Canal and other deteriorating influences. To distinguish works of this kind from those designed to "regulate" the lake, they may be called "compensating" works.

40. The upper Niagara River is a valuable safety-valve for the protection of Buffalo from the effects of storms upon Lake Erie, and should not be obstructed by a dam. It is possible that the extreme lower end of the reach, that is, the section just above the Falls, may not be available because of excessive overflow to be caused in the valley of the Welland River. To determine the best site it has been necessary to make additional surveys. These were begun in July, 1909, and are still in progress. After their completion it is our intention to submit a supplementary report upon the subject.

41. In connection with the hydraulic analysis of the general regulation of all the lakes, attention is invited to a discussion of the regulation of Lake Superior, of Lake Michigan-Huron, and of Lake Ontario, which will be found in the Appendix, paragraphs 125-132, 148-155. Without going into details it may be stated in general terms, that, as in the case of Lake Erie, only a very moderate degree of improvement in regulation over what nature provides is practicable in any of the lakes, and that, such as it is, this improvement is obtained at the expense and to the injury of the navigable channels below. If the level of any lake has been lowered, whether by diversion through the Chicago Drainage Canal or by enlargement of the outlet, the remedy seems to lie in "compensation" rather than in "regulating" works.

42. Attention is invited also to a discussion of the use of Lake Superior as a reservoir, which has been proposed by persons not familiar with the Great Lakes, to compensate for the diversion of water through the Chicago Drainage Canal (see Appendix, paragraphs 133-147). The result of the discussion is to show: 1, that Lake Superior, being naturally one of the greatest and best regulators of flow to be found in the world, maintains a flow in the St. Marys River, its outlet, which is remarkably uniform; 2, that uniformity of flow in that river is essential to the best interests of navigation of the river itself; 3, that during

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the winter months when navigation is suspended this uniformity of flow is still necessary to maintain the level of Lake Huron and keep it in condition to maintain in its turn the St. Clair and Detroit Rivers in the spring when navigation opens. It is not in the power of man to improve this uniformity of flow to any important degree. He may disturb it, making it less uniform, by storing water in Lake Superior, but any water withheld at one season would create a deficiency in the lake below, which must be replaced by an equivalent increase of discharge from Lake Superior at another season. This would simply increase the oscillations in the level of the lakes below, that is, would injure them, without compensating in any degree for the diversion of water through the Chicago Drainage Canal.

GEO. C. GIBBONS,
Chairman, Canadian Section.

W. J. STEWART,
Member, Canadian Section.

LOUIS COSTE,
Member, Canadian Section.

O. H. ERNST,
*Brig. Gen'l, U.S. Army, Retired,
Chairman, American Section.*

GEORGE CLINTON,
Member, American Section.

E. E. HASKELL,
Member, American Section.

Attest:

W. EDWARD WILSON,
Secretary, American Section

THE MINISTER OF PUBLIC WORKS OF CANADA.

THE SECRETARY OF WAR OF THE UNITED STATES.

APPENDIX.

INTERNATIONAL WATERWAYS COMMISSION.
OFFICE OF AMERICAN SECTION,
BUFFALO, N.Y., December 4, 1909.

THE INTERNATIONAL WATERWAYS COMMISSION:

Your Committee, which was appointed to investigate the advisability of locating a dam at the outlet of Lake Erie (as proposed by the Board of Engineers on Deep Waterways) and the maintenance and regulation of suitable levels on the other lakes in the Great Lakes system, now has the honor to report upon these subjects. It is hoped that this investigation will be of assistance to the Commission in considering the subjects mentioned above.

THE GREAT LAKES.

1. The Great Lakes, comprising Lakes Superior, Michigan, Huron, Erie, and Ontario, situated between the United States and Canada, differ from the high seas in that the latter have diurnal tides while the former have periodic and seasonal stage cycles. Lake Superior, the largest of these lakes, has a length from Duluth to Point Iroquois, of 383 miles and a breadth of approximately 160 miles. Its maximum recorded depth is 1012 feet. The outlet of this lake is the St. Marys River. The length of Lake Michigan is approximately 321 miles; its breadth, 118 miles, and its maximum measured depth 870 feet. Lake Huron is about 220 miles long and 101 miles wide, with a maximum measured depth of 750 feet. Lakes Michigan and Huron are connected by the Strait of Mackinac, and their outlet is the St. Clair River. Lake St. Clair is approximately 26 miles long and 24 miles wide; its maximum depth is less than 24 feet, except at the head of the Detroit River, the outlet of the lake. Lake Erie is about 240 miles in length, with a maximum width of 57 miles; its maximum depth as recorded by the U.S. Lake Survey, is 210 feet. Niagara River is the outlet of this lake. Lake Ontario is about 190 miles long, 57 miles wide, and has a maximum recorded depth of 730 feet. The present natural outlet of this lake, as well as of the entire Great Lakes system, is the St. Lawrence River.

AREAS OF THE SEVERAL LAKES AND WATERSHEDS OF THE GREAT LAKES SYSTEM.

2. The areas of the surfaces of the Great Lakes and their watersheds, as determined by the United States Lake Survey, are shown in Table I.

TABLE I.

LAKE	AREA OF LAKE SURFACE IN SQUARE MILES.	DRAINAGE AREA, INCLUDING LAKE SURFACE, IN SQUARE MILES.	RATIO OF LAKE TO LAND AREA.
Superior.....	32,060	76,134	1: 1.37
Michigan.....	22,336	65,799	1: 1.95
Huron.....	22,978	72,008	1: 2.13
Michigan-Huron.....	45,314	137,807	1: 2.04
St. Clair.....	503	6,194	1: 11.31
Erie.....	9,968	34,573	1: 2.47
Ontario.....	7,243	32,980	1: 3.55

Authority: 1906 United States Lake Survey report. (Unpublished).

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3. The land area for any watershed is considered as the difference between the total drainage area and the area of the lake surface. The areas of the small lakes and streams are taken as a part of the land area.

4. The ratio of lake to land area is least for Superior and greatest for St. Clair, and increases with each succeeding lake lower in the system, St. Clair excepted.

WATER-LEVEL RECORDS OF THE GREAT LAKES AND THEIR CONNECTING RIVERS.

5. Beginning about 1860 and continuing to date, daily or tri-daily water-level observations have been taken on the several lakes and connecting channels of the Great Lakes. These readings have been reduced to monthly mean stage by determining the average for the month. In 1899, the first self-registering automatic gauges, giving a continuous graphical record of the rise and fall of the water, were installed. The water-level records tabulated in this report pertain directly to the stage of the waters of the Great Lakes system. In nearly every instance, they have been placed at the service of the Commission through the Chief of Engineers' reports, or have been obtained from the United States Lake Survey.

6. MARQUETTE. The elevation of the water surface of Lake Superior above mean tide at New York was observed at Superior, Wis., for the period from 1860 to 1871, inclusive, while from 1872 to 1907, inclusive, it was observed at Marquette, Mich. The self-registering gage, located at Marquette, was placed in operation in November, 1902. During the forty-eight years of observations there were months when no records were taken. For the years 1860 and 1861, missing values have been supplied by adding (algebraically) to the observed reading of the following or preceding month the monthly mean rise or fall of water surface from 1860 to 1871, inclusive. Missing values in the period from 1871 to 1888, inclusive, have been supplied by adding to Sault Ste. Marie, Mich., readings the monthly mean fall from Marquette to Sault Ste. Marie for that period. Missing values for the period from 1889 to 1901, inclusive, have been supplied from the Sault Ste. Marie readings by applying to these readings the monthly mean fall from Marquette to Sault Ste. Marie for that period. The stage of Lake Superior, from 1860 to 1907, inclusive, at Marquette, Mich., and Superior, Wis., is given in Table 2.

7. SAULT STE. MARIE. The monthly mean stage of the St. Marys River, the outlet to Lake Superior, was observed at the southwest pier, Sault Ste. Marie, Mich. (above the locks), from November, 1870, to December, 1907, inclusive. Before November, 1899, the readings were taken with a staff gage, but since that time a self-registering gage has been in operation. To make the records complete from January, 1860, to October 1870, inclusive, the mean monthly fall from 1871 to 1888, inclusive, from Marquette to Sault Ste. Marie, has been subtracted from the corresponding Marquette readings. These monthly mean stages at Sault Ste. Marie (above the locks) are given in Table 3.

8. MILWAUKEE. The water-level records giving the stage of water of Lake Michigan, from 1860 to 1907, inclusive, were taken at Milwaukee, Wis. The monthly mean elevations of water-surface are given in Table 4.

9. HARBOR BEACH. From September, 1874, to December, 1907, inclusive, the stage of Lake Huron was observed at Harbor Beach, Mich. (formerly Sand Beach). From April, 1901, to December, 1907, inclusive, the stage was recorded by a self-registering gage. The water levels from January, 1860, to August, 1874, inclusive, were derived by the United States Lake Survey (see page 4105, appendix EEE, annual report of the Chief of Engineers for 1904), as follows:

January, 1860, to September, 1864, inclusive, from observations at Point aux Barques; and October, 1864, to August, 1874, inclusive, from observations at Port Austin. These water levels for Lake Huron stage, from 1860 to 1907, inclusive, are given in Table 5.

10. G. T. R. Water-level observations have been taken near the head of the St. Clair River, at G. T. R. (Grand Trunk Railway) from March, 1899 to December, 1907, inclusive. The computed G.T.R. monthly mean gage readings from January, 1860, to February, 1899, inclusive, were derived from the relation deduced between the monthly mean stage at Harbor Beach and Grand Trunk Railway, from March, 1899, to December, 1904, inclusive. The equations are: for assumed open season, from April to December, (G. T. R.—578) = 0.889 (Harbor Beach—578) — 0.529, and for the winter season of January, February and March, (G. T. R. —578) = 0.889 (Harbor Beach—578) — 0.235. The actual observations showed that during the average open season the fall from Harbor Beach to G. T. R. remained practically constant for the same stage, but increased slightly with increasing stages of Lake Huron, while during the winter months the fall decreased materially but also increased slightly with increasing stages of the lake. The G.T.R. gage data are shown in Table 6.

11. ST. CLAIR FLATS CANAL. In July, 1872, the first authentic records of the stage of Lake St. Clair were taken at the St. Clair Flats Canal. These readings were recorded continuously up to December, 1907, inclusive, with the exception of October, 1877; April and May, 1878; June, 1879, to August, 1881, inclusive; November, 1881, to April, 1882, inclusive; June, September, and October, 1882; December, 1882, to April, 1883, inclusive; January to March, 1902, inclusive; February to April, 1903, inclusive; January, 1906, to October, 1906, inclusive; and August, 1907, to December, 1907, inclusive. From January, 1860, to June, 1872, inclusive, no observations were taken. Values for the missing monthly mean water levels at St. Clair Flats Canal for January, 1861, to July, 1865, inclusive; January, 1866; April and May, 1878, and June, 1879, to August, 1881, inclusive, have been deduced from the monthly means of observations taken simultaneously at St. Clair Flats Canal, the Light-house Depot, Detroit, Mich. (see 1868 United States Lake Survey report in report of the Secretary of War, Fortieth Congress, third session, Vol. 2, 1868-69, p. 985), and Amherstburg, Ont., from which the derived relation between fall from Light-house Depot to Amherstburg, and fall from St. Clair Flats to Amherstburg has been determined. The equation expressing this relation is: (Fall St. Clair Flats to Amherstburg) = 1.0357 (Fall Light-house Depot to Amherstburg) + 0.377. Those missing for January, 1868, to March, 1868, inclusive; January, 1869, to March, 1869, inclusive; December, 1869, to March, 1870, inclusive; January and February, 1871; and December, 1871, to March, 1872, inclusive, have been derived from the monthly means of observations taken simultaneously at St. Clair Flats Canal, Old Detroit Waterworks, located at the foot of Orleans Street, Detroit Mich. (see Forty-ninth regular report of the Board of Water Commissioners to the Common Council of the City of Detroit, 1901), and Amherstburg, Ont., from which has been derived the relation between the fall from St. Clair Flats to Old Detroit Waterworks, and fall from St. Clair Flats to Amherstburg. The derived equation is: (Fall St. Clair Flats to Amherstburg) = 0.9378 (Fall Old Detroit Waterworks to Amherstburg) + 0.853. Those missing for August, 1865, to December, 1865, inclusive; February, 1866, to December, 1867, inclusive; April, 1868, to December, 1868, inclusive; April, 1869, to November, 1869, inclusive; April, 1870, to December, 1870, inclusive; March, 1871, to November, 1871, inclusive; April, 1872, to June, 1872, inclusive; and October, 1877, have been derived independently from Light-house Depot observations and from Old Detroit Waterworks' records

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taken at the foot of Orleans Street, Detroit, Mich., as previously explained. The mean of the two derived values has been used for St. Clair Flats. For all months of the year 1860, the St. Clair Flats values (as given on p. 4097, United States Lake Survey report of 1904) have been reduced by 0.67 foot, so as to obtain the original readings taken at the Old Detroit Waterworks, foot of Orleans Street, which were not available. From the original readings thus obtained, new values for stage at St. Clair Flats Canal have been derived by the fall method previously described. The value 0.67 foot represents the mean fall from St. Clair Flats Canal to Old Detroit Waterworks, as deduced on p. 4082 of the United States Lake Survey report for 1904. The derived values for November, 1881, to April, 1882, inclusive; June, September, and October, 1882; and December, 1882, to April, 1883, inclusive, have been obtained by first subtracting 0.48 foot (0.477) from the New Detroit Waterworks' readings and then applying the mean monthly fall from St. Clair Flats to New Detroit Waterworks, as deduced from observations taken at those points from January, 1889, to June, 1901, inclusive. The value referred to above (0.48 foot) represents the discrepancy in the elevation of the zero of the New Detroit Waterworks' gage, as determined about 1878 and during the period from 1893 to 1897. In the forty-ninth regular report of the Board of Water Commissioners of Detroit, it was assumed that the error occurred when the gage was moved and that it had remained at a constant elevation from January, 1878, until 1893. A comparison of these data with those taken simultaneously at St. Clair Flats Canal indicates that the change occurred after May, 1889. Those for January to March, 1902, inclusive; February to April, 1903, inclusive; January to October, 1906, inclusive; and August to December, 1907, inclusive, have been derived from the observations taken at Windmill Point, Lake St. Clair, by applying the mean monthly fall from St. Clair Flats Canal to Windmill Point, as determined from simultaneous observations taken at those points from January, 1897, to July, 1907, inclusive. The monthly mean levels of Lake St. Clair, at St. Clair Flats Canal, are given in Table 7.

12. WINDMILL POINT. Water-level readings have been taken at Windmill Point, near the outlet of Lake St. Clair, by the United States Lake Survey, from 1897 to 1907, inclusive, with the exception of February, 1898, and May and June, 1902. The monthly mean stage values from January, 1860, to December, 1896, inclusive, and for the three missing months mentioned above, have been derived from the St. Clair Flats Canal readings by applying to those values the mean monthly fall from St. Clair Flats Canal to Windmill Point, as determined from simultaneous observations made at those points from January, 1897, to July, 1907, inclusive. The monthly mean values at Windmill Point are given in Table 8.

13. AMHERSTBURG. For several years, commencing with July, 1899, water-surface readings have been taken at the foot of the Detroit River, by which a good relation has been obtained between the water levels at Cleveland, Ohio, and Amherstburg, Ont. The values from January, 1860, to June, 1899, inclusive, and July to December, 1907, inclusive, were derived by applying to the Cleveland, Ohio, readings the mean monthly fall from Amherstburg to Cleveland, as determined from simultaneous observations at those places from July, 1899, to December, 1904, inclusive. The Amherstburg monthly mean water-surface readings are shown in Table 9.

14. CLEVELAND. Water-level readings of Lake Erie, have been taken at Cleveland, Ohio, from 1860 to 1907, inclusive, with the exception of January, 1877, and October, 1880, to March, 1881, inclusive, which values have been supplied by applying to the monthly mean values for Erie, Pa., the corresponding yearly mean difference of stage between Erie and Cleveland. The values from

January, 1860, to December, 1903, inclusive, have been taken from the United States Lake Survey report for 1904, beginning with p. 4097. Those from January, 1904, to December, 1907, inclusive, have been taken from the United States Lake Survey annual reports. These monthly mean water levels of Lake Erie, at Cleveland, Ohio, are given in Table 10.

15. **BUFFALO.** All of the water-surface records taken at Buffalo, prior to March, 1887, were accidentally destroyed, and values have been derived from Cleveland readings by applying to such readings the mean monthly fall from Cleveland to Buffalo, as derived from simultaneous observations taken at those places from June, 1899, to December, 1906, inclusive. Values for January and February, 1901, and December, 1902, have been supplied in the same way. From 1888 to 1898, inclusive, the monthly means have been derived from the U.S. Lake Survey tables by subtracting 0.1 foot from the records there given. This correction has been determined by a comparison with Cleveland of the mean of the three months, June, July, and August, for each year during this period. From March, 1899, to December, 1907, inclusive, the gage records have been taken with a self-registering automatic gage, located at the Buffalo Breakwater Light-house. The monthly mean elevations of Lake Erie, at Buffalo, N.Y., from 1860 to 1907, inclusive, are given in Table 11.

16. **CHARLOTTE.** Water-level readings of Lake Ontario have been taken at Charlotte, N.Y., from January, 1860, to October, 1907, inclusive. In 1906, the United States Lake Survey's automatic gage was destroyed and since that time has not been replaced. These monthly mean water-surface elevations of Lake Ontario at Charlotte, N.Y., are given in Table 12.

17. **OSWEGO.** Water-level observations have been taken at Oswego, N.Y., from 1860 to 1907, inclusive. These water levels give the true elevations of Lake Ontario for that period, with the possible exception of some spring months when the Oswego River is at flood stage. These water-surface elevations of Lake Ontario, at Oswego, N.Y., are given in Table 13.

18. **OGDENSBURG.** The water-level records of the St. Lawrence River, taken at Ogdensburg, N.Y., are very incomplete. The missing monthly means for Ogdensburg have been derived from Oswego readings by use of the following equation, which has been derived from monthly mean levels at those two places, as deduced from simultaneous observations: $(\text{Ogdensburg}-240) = 0.9426 (\text{Oswego}-240) - 0.553$. The St. Lawrence River water levels, at Ogdensburg, are shown in Table 14.

19. **LOCK 27.** The Canadian Government has observed the stage of water on the sills of the several locks in the St. Lawrence canals for many years. The observations taken at Lock 27, which is located at the head of Galop Rapids in the St. Lawrence River, date from January, 1875, and are complete to December, 1907, inclusive, with the exception of June, 1878, February, 1880, and August and September, 1890, the values for which have been derived from Oswego values, using the following formula: $(\text{Lock 27}-240) = 0.9457 (\text{Oswego}-240) - 1.845$. For the period from January, 1860, to December, 1874, inclusive, the water-level values have been derived from Oswego, N.Y., readings according to the above formula, which assumes a mean-fall relation between Oswego and Lock 27 during that period. Table 15 gives the monthly mean water-level records of the St. Lawrence River, at Lock 27, head of Galop Rapids, from 1860 to 1907, inclusive.

20. **LOCK 24.** The water-level readings taken at Lock 24 have been observed from January, 1880, to December, 1907, inclusive, and are complete with the exception of February, 1880, April and May, 1882, and May, 1890. Lock 24 is located at the head of the Morrisburg Canal. This canal was built along a portion of the north shore of the St. Lawrence River, and provides a 14-foot

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navigable channel around the Rapide Plat. Table 16 gives the monthly water levels at Lock 24, head of Rapide Plat, St. Lawrence River, from January, 1880, to December, 1907, inclusive.

21. Lock 21. The stage observations taken at Lock 21, the upper entrance to the Cornwall Canal and at the head of the Long Sault Rapids in the St. Lawrence River, were begun January, 1870, and are complete to December, 1907, inclusive, with the exception of September, 1882. The monthly mean water-surface readings at Lock 21, Cornwall Canal, head of Long Sault Rapids, St. Lawrence River, are given in Table 17.

22. Plate 1 shows the monthly mean stage of Lakes Superior, Michigan-Huron, St. Clair, Erie, and Ontario from 1860 to 1907, inclusive.

NOMENCLATURE.

23. The following abbreviations and terms are used in this report:

- S = Total supply to any lake, in cubic feet per second.
- R = Run-off from watershed, in cubic feet per second.
- D = Discharge of lake's outlet, in cubic feet per second.
- E = Evaporation from lake surface, in cubic feet per second.
- P = Precipitation on lake surface, in cubic feet per second.
- I = Inflow or transmitted supply from lake above, in cubic feet per second.
- L = Local supply, or supply from lake's own drainage area, in cubic feet per second.
- s = Storage on lake surface, in cubic feet per second (positive or negative).
- A = Area of lake, in square feet.
- h = Depth, in feet, on lake surface, measured from any datum.
- t = Time, in seconds, for one-twelfth of a year.
- i = Increment, or rate of change of discharge in cubic feet per second per foot change in stage.
- u = Coefficient.
- g = Acceleration due to gravity, = 32.2 feet per second per second.
- b = Width of section, or length of crest of submerged weir in feet.
- h_U = Head, in feet, on crest of submerged weir, measured from upstream side.
- h_D = Head, in feet, on crest of submerged weir, measured from downstream side.
- F = Fall in stream, expressed in feet.
- C = Coefficient.
- V = Mean velocity, in feet per second.
- k = Theoretical velocity head, in feet, = $V^2 \div 2g$.
- h_s = Height of swell, in feet.
- d = Mean depth, in feet.
- $R_{MAX.}$ = Ratio between the maximum value of mean monthly discharge and the maximum value of mean monthly total supply to any lake.
- $T_{MAX.}$ = Time interval in days between the date of the occurrence of the maximum value of mean monthly total supply to any lake and that of the maximum value of mean monthly discharge from that lake.
- $T_{MIN.}$ = Time interval in days between the date of the occurrence of the minimum value of mean monthly total supply to any lake and that of the minimum value of mean monthly discharge from that lake.

GENERAL EQUATION FOR STREAM FLOW.

24. The discharge equations of all rivers in the Great Lakes system, with the exception of the St. Marys River, have been derived by use of a submerged-weir formula. Each river bed has been assumed to represent a submerged weir with a broad, flat crest, whose upstream and downstream faces are of considerable length. The location of the submerged weir has been assumed to be at or near the critical cross section, which is generally at the head of the river. The submerged-weir formula is generally recognized in one of the following two forms:

$$D = u \frac{2}{3} b \sqrt{2g} (h_U - h_D)^{\frac{3}{2}} + ubh_D \sqrt{2g} (h_U - h_D)^{\frac{1}{2}} \quad (1)$$

$$D = u \frac{2}{3} b \sqrt{2g} \left(h_U + \frac{h_D}{2} \right) (h_U - h_D)^{\frac{1}{2}} \quad (2)$$

where h_U represents the depth on the average elevation of the crest of the weir, measured from the upstream side,
 h_D the depth on the average elevation of the crest of the weir, measured from the downstream side, and

b , the length of the weir crest in feet. The quantity, $(h_u - h_d)$, represents the fall (F) in the stream, or the difference between the upstream and downstream heads. The quantity, $u^{2/3} b \sqrt{2g}$, taken as a whole, represents a variable coefficient (C) which has been derived for each river and is applicable only to that river. This submerged-weir formula reduces to the form,

$$D = CF^{\frac{1}{2}} \left(h_u + \frac{h_d}{2} \right) \quad (3)$$

and was so used in deriving the discharge equations of the several rivers. For every measurement of river discharge, all factors are known, with the exception of the coefficient, which has been derived. Knowing the way in which the coefficient for each river varies according to the upstream and downstream head, it is a comparatively simple matter to compute the discharges of the several outlets according to the proper formula. On the St. Clair, Detroit, and St. Lawrence Rivers, the coefficients vary as a function of the upstream and downstream head on the submerged weir. The curve used, showing the manner in which C varies, is the equilateral hyperbola, with its asymptotes parallel to the co-ordinate axes. It is:

$$C = \frac{y}{1 + \frac{x}{h_u}} \quad (4)$$

in which C is the coefficient depending on h_u or h_d , the upstream or downstream head, respectively.

x and y are constants, which represent the distance of the asymptotes from the y and x axes, respectively.

For convenience in deriving the unknown values, this hyperbolic equation has been transformed into a straight-line equation by dividing by y , which gives

$$C = \frac{1}{\frac{1}{y} + \frac{x}{yh_u}} \quad (5)$$

and then taking the reciprocal of each member:

$$\frac{1}{C} = \frac{1}{y} + \frac{x}{y} \left(\frac{1}{h_u} \right) \quad (6)$$

DISCHARGE OF ST. MARYS RIVER, OUTLET TO LAKE SUPERIOR.

25. The St. Marys River, from Point Iroquois, in Lake Superior, to the head of the United States Ship Canal, at Sault Ste. Marie, Mich., is a wide stream with comparatively little slope, there being about two-tenths of a foot fall in this distance. At the latter location, rapids (about one-half a mile in length) connect the upper and lower St. Marys River. The submerged weir of rock at the head of these rapids controls the discharge of water from Lake Superior, and any change in this submerged weir would cause a change in the volume of discharge for the same stage. Any auxiliary channel connecting with the pool immediately above the weir would increase the river discharge for the same stage by the volume thus diverted. During the epoch, 1860 to 1907, inclusive, the regimen of the St. Marys River, above the rapids, was changed on several occasions. In 1887 and 1888, the International Bridge across the St. Marys Rapids was constructed. Prior to that time, the river discharged at the bridge site through four channels, viz., the main rapids and three small streams situated between the islands lying adjacent to the north shore. The building of the bridge piers and approaches and the filling in of portions of the three small streams (called a , b , and c) on the north side of the main channel reduced the effective area at this critical discharge cross section so that the flow of the St. Marys River was materially decreased.

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26. In 1889, the Canadian Water Power Company (now the Lake Superior Power Company) commenced work on a power plant and used for its canal the northerly of the three small streams (*c*) previously mentioned. The flow therein was practically stopped until the latter part of 1895, when this power plant was opened. During the year 1892, the Edison Sault Electric Light & Power Company (now the Chandler-Dunbar Water Power Company) built a dyke from the second pier on the American side of the International Bridge, parallel to the shore, for a distance of about 1,500 feet down the stream. The area inclosed by the American shore and this dyke is used as a forebay by the power company, practically shutting off from the main channel the flow through these two spans. By December, 1892, the flow of the river had been restricted by the building of the piers and approaches to the International Bridge, the shutting off of spans 1 and 2 from the main channel on the American side, and the closing of stream *c* on the Canadian side. Beginning in December, 1895, the Lake Superior Power Company started the operation of its plant on a large scale, using water at the rate of approximately 3800 cubic feet per second. This power plant has been in continuous operation since then, with the exception of February and March, 1896, and has gradually increased the quantity of water used until it now reaches about 6000 cubic feet per second. The use of water by the American and Canadian locks has also increased from time to time until it now amounts to an average flow of about 600 cubic feet per second. In 1901, the Michigan Lake Superior Power Company started work on the construction of a compensating works in the rapids of the St. Marys River, about 300 feet above the International Bridge. These works practically shut off the entire flow through spans 9 and 10, the first two spans on the Canadian side of the river. In January, 1905, the Michigan Lake Superior Power Company began to divert water through its canal, using about 8500 cubic feet per second at that time.

27. DISCHARGE MEASUREMENTS. During the winter of 1896, discharge measurements of the St. Marys River were taken by the United States Government at Spry's Dock Section, located about a mile below the St. Marys Rapids. The discharge equation deduced from these observations, modified for the various efflux conditions, has been the governing factor for the determination of the outflow of Lake Superior from January, 1860, to September, 1901, inclusive. The derived equation is:

$$D_{\text{RIVER}} = 18826 (\text{Southwest Pier Gage} - 600) + 37060. \quad (7)$$

See 1906 United States Lake Survey report (unpublished).

28. The Southwest Pier Gage is located at the southwest pier above the American locks at Sault Ste. Marie, Mich. At the time that these measurements were taken, the Chandler-Dunbar Water Power Company was using 1065 cubic feet of water per second through its works; streams *a* and *b* on the north side of the main channel were still open, and the Lake Superior Power Company's plant was closed.

29. In 1902, the United States Lake Survey measured the flow through the St. Marys Rapids at the International Bridge, which connects Sault Ste. Marie, Mich., with Sault Ste. Marie, Ont. The discharge equation derived from these observations gives the flow through the rapids after spans 9 and 10 (the first two spans on the Canadian side) were closed by the construction of the compensating works of the Michigan Lake Superior Power Company. It is:

$$D_{\text{RAPIDS}} = 15540 (\text{Southwest Pier Gage} - 600) + 30510. \quad (8)$$

30. During February and March, 1905, observations of the flow in the St. Marys River were taken at "Section Brewery," located about 2000 feet below the Spry's Dock Section. The discharge equation derived from these measurements is:

$$D_{\text{RIVER}} = 18484 (\text{Southwest Pier Gage} - 600) + 41829. \quad (9)$$

This formula gives the total flow of the river, while that derived from the 1902 measurements gives only the flow through the St. Marys Rapids.

31. ST. MARYS RIVER DISCHARGE FORMULAE, AS USED FOR THE DIFFERENT EFFLUX CONDITIONS. The discharge formula governing the first period, 1860-1888, inclusive, was derived from the measurements made in 1896 and 1902 (the fifth and tenth periods of efflux) in conjunction with hydraulic data taken at the International Bridge Section in 1901 and 1902. The mean stage of the St. Marys River at the Southwest Pier (above the locks), Sault Ste. Marie, Mich., from 1871 to 1905, inclusive, was 601.86 feet above mean tide at New York. The 1896 discharge measurements give: $D_{\text{RIVER}} = 18826$ (Southwest Pier Gage - 600) + 37060. The discharge of the river at mean stage was 72076 cubic feet per second. Deducting from this value 1065 cubic feet per second (the amount of water used by the Chandler-Dunbar Water Power Company) and 1798 cubic feet per second (the discharge of two small streams on the north side of the rapids) gives the flow through the main channel of the St. Marys Rapids as 69200 cubic feet per second. From the vertical and transverse percentage velocity curves deduced from observations made at the Bridge Section, for spans 3-10, inclusive, in 1901, and for spans 3-8, inclusive, in 1902, the ratio of flow of the entire cross section to that for any partial section has been determined. These curves show the modification in the transverse velocity curve due to the construction, by the Michigan Lake Superior Power Company, of the compensating works located about 300 feet above the bridge. With these data, the transverse percentage velocity curve at the International Bridge Section, for the first period, has been constructed for the entire main channel, which included the channels for spans 1 and 2 of the bridge, next the American shore. This curve has been integrated and its mean ordinate, or mean percentage velocity, computed. The product of this value and the mean velocity of the rapid's flow at mean river stage under the 1896 conditions, or during the fifth period of efflux, gives the mean velocity for the main channel under the original conditions or for the first period of efflux. The product of the mean velocity and the area of the cross section before the bridge was built gives the discharge of the main channel for mean river stage. The equations giving the actual computations are:

$$\begin{aligned} D_1 &= A_1 \left(\frac{D_5}{A_5} \times \text{mean percentage } V_1 \right) = A_1 V_1 \\ &= 13690 \left(\frac{69200}{10650} \times 0.925 \right) = 13690 \times 6.01 = 82280 \text{ cubic feet per} \end{aligned} \quad (10)$$

second, discharge of main channel for mean river stage under original conditions.

32. With the volume of flow known for mean river stage, the only remaining step is to derive the increment of discharge per foot change in stage. In deriving this increment, use has been made of Bernoulli's theorem applied to open channels with steady flow, expressed as follows:

$$\text{Friction head} = F + \frac{V_{\text{UPSTREAM}}^2}{2g} - \frac{V_{\text{DOWNSTREAM}}^2}{2g} \quad (11)$$

33. It has been assumed that the friction heads before and after the rise were proportional to the squares of the respective velocities at the Bridge Section. The two cross sections used are: The upper one, located nearly opposite the Southwest Pier Gage, and the lower one, at the International Bridge. Under original conditions, the areas of the upper and lower cross sections were 46260 and 13690 square feet, respectively, and the widths were 3400 and 2383 feet, respectively, at 601.86 feet, the mean river stage at Southwest Pier Gage. According to formula 10, the discharge of the river at this stage was 82280 cubic feet per second. The corresponding mean water surface at the Bridge

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Section was 600.56 feet. Substituting these values in the preceding formula gives: Friction head before rise = $1.30 + 0.049 - 0.562 = 0.787$ foot. Actual measurements taken under the conditions existing for the fifth and tenth periods show that a rise of 1 foot at Southwest Pier Gage for mean river stage caused a rise of 0.636 and 0.592 foot at the bridge, respectively. These are the values for rise before and after the compensating works had been constructed. The mean of the above values (0.614 foot) has been used as the assumed rise under original conditions, since the relation appeared to be nearly constant for two radically different discharge periods. After a rise of 1 foot at the upstream

section, the mean velocity became $\frac{D}{49660}$ feet per second, and the corresponding velocity head was $\frac{D^2}{(49660)^2 \cdot 2g}$. For the rise of 0.614 feet at the downstream section,

the mean velocity became $\frac{D}{15150}$ feet per second, and the corresponding velocity head was $\frac{D^2}{(15150)^2 \cdot 2g}$. The potential head after rise was: $F = 1.30 + 1.00 - 0.614 =$

1.686 feet. Substituting the new values in Bernouilli's formula gives: Friction

head after rise = $1.686 + \frac{D^2}{(49660)^2 \cdot 2g} - \frac{D^2}{(15150)^2 \cdot 2g}$. Under the previous assumption

that the friction heads before and after the rise were proportional to the square velocities, we have:

$$0.787 : 1.686 + \frac{(\frac{D}{49660})^2}{2g} - \frac{(\frac{D}{15150})^2}{2g} :: 6.01^2 : (\frac{D}{15150})^2 \quad (12)$$

whence $D = 103840$ cubic feet per second. This value represents the discharge through the main channel at 1 foot above mean river stage, 601.86. The difference between this discharge value and 82280, the discharge for mean stage, is 21560 cubic feet per second, the increment of discharge for 1 foot rise above mean stage. This method was also used for the determination of the increment for one foot below mean stage, which gave 20720. The mean of 21560 and 20720, viz., 21140 cubic feet per second, has been used as the increment of discharge.

34. The discharge formula governing the flow through the main channel for the first period is as follows:

$$D_1 \text{ MAIN CHANNEL} = 21140 (\text{Southwest Pier Gage} - 601.86) + 82280. \quad (13)$$

35. The two small streams (*a* and *b*) situated on the north side of the main channel had a flow of 1800 cubic feet per second at mean river stage, with an estimated increment of discharge per foot rise of 950 cubic feet per second. The third small stream (*c*) situated also on the north side of the main channel had an estimated flow of 1800 cubic feet per second at mean river stage, with an estimated increment of discharge per foot rise of 950 cubic feet per second. By combining the above results, the discharge formula of the St. Marys River for the original conditions, or first period (January, 1860, to November, 1888, inclusive), before any alterations had occurred in the outlet to Lake Superior above the St. Marys Rapids, is:

$$D_1 = 23040 (\text{Southwest Pier Gage} - 601.86) + 85880. \quad (14)$$

36. The construction of any engineering structure necessarily takes time; so, in the building of the piers and approaches for the International Bridge, some time elapsed before the completion of the substructure. It is assumed that original conditions prevailed to December 1, 1888, after which the piers and approaches for the International Bridge are considered as having been com-

pleted, and stream *c*, adjacent to the north shore, as having been closed. This date marks the beginning of the second period, which is assumed to continue to December, 1892, inclusive. The discharge formula governing the flow through the main channel for this efflux condition has been computed in the same way as that for the first period. It is:

$$D_2 \text{ MAIN CHANNEL} = 19080 (\text{Southwest Pier Gage} - 601.86) + 77200. \quad (15)$$

37. Two small streams (*a* and *b*) situated on the north side of the main channel were still flowing, as in the first period. Combining the results of the flow through the main channel and streams *a* and *b* gives the total flow in the St. Marys River for the second period as:

$$D_2 = 20030 (\text{Southwest Pier Gage} - 601.86) + 79000. \quad (16)$$

38. For the third period, January, 1893, to November, 1895, inclusive, the efflux condition was the same as that for February and March, 1896, when the discharge measurements were taken. It is assumed that the Chandler-Dunbar Water Power Company closed spans 1 and 2, on the American end of the International Bridge, at the beginning of this period. The volume of water used by them was estimated to be about 1065 cubic feet per second. Streams *a* and *b* were still flowing. The equation of discharge for St. Marys River for the third efflux condition is:

$$D_3 = 18826 (\text{Southwest Pier Gage} - 600) + 37060. \quad (17)$$

39. In December, 1895, the beginning of the fourth period, the Lake Superior Power Company began using water on a large scale, estimated by the chief engineer of the Lake Superior Power Company at 3800 cubic feet per second. The Chandler-Dunbar Water Power Company is assumed to have been still using 1065 cubic feet per second. Streams *a* and *b* were still flowing. The discharge equation for the fourth period, from December, 1895, to January, 1896, inclusive, is:

$$D_4 = 18826 (\text{Southwest Pier Gage} - 600) + 40860. \quad (18)$$

40. The fifth epoch, February and March, 1896, marks the date of the first discharge measurements of the St. Marys River used in this report. The discharge formula for the river flow is:

$$D_5 = 18826 (\text{Southwest Pier Gage} - 600) + 37060. \quad (19)$$

41. For the sixth period, April, 1896, to December, 1897, inclusive, the auxiliary flow is estimated at 3500 cubic feet per second through the works of the Lake Superior Power Company. Streams *a* and *b* were still open. The Chandler-Dunbar Water Power Company was using approximately 1065 cubic feet per second. The three latter are included in the river discharge formula as derived from observations made in February and March, 1896. The discharge equation of the St. Marys River for this period is:

$$D_6 = 18826 (\text{Southwest Pier Gage} - 600) + 40560. \quad (20)$$

42. For the seventh period, January, 1898, to March, 1899, inclusive, 4000 cubic feet per second is estimated as the side flow through the works of the Lake Superior Power Company. Streams *a* and *b* were still flowing. The Chandler-Dunbar Water Power Company is estimated to have been still using about 1065 cubic feet per second. The discharge through the locks for this period and previous thereto has not been incorporated in the discharge equations, owing to the fact that it is considered to have been, comparatively, a small quantity. The discharge equation giving the flow of the St. Marys River for this period is:

$$D_7 = 18826 (\text{Southwest Pier Gage} - 600) + 41060. \quad (21)$$

43. For the eighth period, April, 1899, to December, 1899, inclusive, the side flow through the works of the Lake Superior Power Company is estimated

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at 4000 cubic feet per second. Streams *a* and *b* were still flowing. The Chandler-Dunbar Water Power Company is assumed to have increased its flow at the beginning of the period from 1065 cubic feet per second to 1400 cubic feet per second. It is estimated that the American and Canadian locks were using at that time an average flow of 600 cubic feet per second. By combining the above data, the net side flow, other than that at the time of the 1896 discharge measurements, $= 4000 + (1400 - 1065) + 600 = 4935$ cubic feet per second, (4940 used). The discharge formula for the St. Marys River for this period is:

$$D_8 = 18826 (\text{Southwest Pier Gage} - 600) + 42000. \quad (22)$$

44. For the ninth period, January, 1900, to September, 1901, inclusive, streams *a* and *b* are assumed to have been closed at the beginning of the epoch. The shutting of these two channels decreased the increment of discharge per foot rise by 950 cubic feet per second, or to 17880, but did not change the total discharge for the main channel at stage 600 on account of the discharge of streams *a* and *b* being approximately zero at this stage. The side flow through the works of the Lake Superior Power Company is estimated to have been 5000 cubic feet per second. The Chandler-Dunbar Water Power Company and the American and Canadian locks are assumed to have been using 1400 and 600 cubic feet per second, respectively. By combining the above data, the net side flow of the river, other than that at the time of the 1896 measurements, was: $5000 + (1400 - 1065) + 600 = 5935$ cubic feet per second (5940 used). The discharge formula for the St. Marys River for this period is:

$$D_9 = 17880 (\text{Southwest Pier Gage} - 600) + 43000. \quad (23)$$

45. For the tenth period, October, 1901, to December, 1904, inclusive, the discharge formula derived from the measurements taken at the International Bridge in 1902, after the compensating works had been constructed by the Michigan Lake Superior Power Company, is:

$$D_{10 \text{ MAIN CHANNEL}} = 15540 (\text{Southwest Pier Gage} - 600) + 30510. \quad (24)$$

46. This equation represents the flow through the St. Marys Rapids and does not take into account the flow through the Chandler-Dunbar Water Power Company's forebay and plant. Previous to this period, the quantity of water used by the Chandler-Dunbar Water Power Company is considered directly in the discharge equation. The side flow through the works of the Lake Superior Power Company is estimated to have been 5000 cubic feet per second. The Chandler-Dunbar Water Power Company and the American and Canadian locks are estimated to have been using about 1400 cubic feet per second and 600 cubic feet per second, respectively. The discharge formula of the St. Marys River, used for this efflux condition, is:

$$D_{10} = 15540 (\text{Southwest Pier Gage} - 600) + 37510. \quad (25)$$

47. For the eleventh period, January, 1905, to December, 1907, inclusive, the discharge formula depends on discharge measurements made by the United States Lake Survey in February and March, 1905, at "Section Brewery," located about 2000 feet below Spry's Dock Section, which was situated opposite the power house belonging to the Michigan Lake Superior Power Company. During this period, the side flow through the works of the Lake Superior Power Company, the Michigan Lake Superior Power Company, the Chandler-Dunbar Water Power Company, and the American and Canadian locks is estimated at 6000, 8500, 1400, and 600 cubic feet per second, respectively. The discharge formula giving the total flow of the river for this period, based on the 1905 measurements, is:

$$D_{11} = 18484 (\text{Southwest Pier Gage} - 600) + 41830. \quad (26)$$

48. It has been noted that the discharge formulæ for efflux periods 10 and 11 show a difference in the increment of discharge of 2944 cubic feet per second

for substantially the same conditions, the only known change in the regimen being an assumed constant diversion of 8500 cubic feet per second through the canal of the Michigan Lake Superior Power Company. This difference in increment is probably due in part to greater leakage at high stage through the dam of the Chandler-Dunbar Water Power Company.

49. The following table gives a summary of the discharge equations for the St. Marys River for the several efflux periods:

TABLE 18.
SUMMARY OF THE ST. MARYS RIVER DISCHARGE EQUATIONS FOR THE
DIFFERENT EFFLUX CONDITIONS.

NO. OF PERIOD	LENGTH OF PERIOD	DISCHARGE EQUATION, ST. MARYS RIVER
1	Jan. 1860—Nov. 1888	$D_1 = 23040 \text{ (Southwest Pier Gage—601.86) } + 85880$
2	Dec. 1888—Dec. 1892	$D_2 = 20030 \text{ (Southwest Pier Gage—601.86) } + 79000$
3	Jan. 1893—Nov. 1895	$D_3 = 18826 \text{ (Southwest Pier Gage—600.00) } + 37060$
4	Dec. 1895—Jan. 1896	$D_4 = 18826 \text{ (Southwest Pier Gage—600.00) } + 40860$
5	Feb. 1896—Mar. 1896	$D_5 = 18826 \text{ (Southwest Pier Gage—600.00) } + 37060$
6	Apr. 1896—Dec. 1897	$D_6 = 18826 \text{ (Southwest Pier Gage—600.00) } + 40560$
7	Jan. 1898—Mar. 1899	$D_7 = 18826 \text{ (Southwest Pier Gage—600.00) } + 41060$
8	Apr. 1899—Dec. 1899	$D_8 = 18826 \text{ (Southwest Pier Gage—600.00) } + 42000$
9	Jan. 1900—Sep. 1901	$D_9 = 17880 \text{ (Southwest Pier Gage—600.00) } + 43000$
10	Oct. 1901—Dec. 1904	$D_{10} = 15540 \text{ (Southwest Pier Gage—600.00) } + 37510$
11	Jan. 1905—Dec. 1907	$D_{11} = 18484 \text{ (Southwest Pier Gage—600.00) } + 41830$

Southwest Pier Gage gives the elevation of the water surface of St. Marys River at Southwest Pier, above the locks, Sault Ste. Marie, Mich., above mean tide at New York.

50. The monthly mean discharge values of the St. Marys River, from January, 1860, to December, 1907, inclusive, are given in Table 19.

51. PROBABLE EFFECT UPON MEAN LEVEL OF LAKE SUPERIOR OF OBSTRUCTIONS IN ST. MARYS RIVER AT HEAD OF RAPIDS. Any obstruction placed in a river at or near its critical or controlling discharge section changes the volume of flow and affects the level of the lake above and also the levels of those below. The construction of the piers and approaches of the International Bridge changed the discharge of the river and raised the mean level of Lake Superior. The shutting off of spans 1 and 2 on the American side, from the main channel, by the Chandler-Dunbar Water Power Company, and the construction of the compensating works by the Michigan Lake Superior Power Company have also had their effect on the level of Lake Superior and the lower lakes. The ultimate effect of these obstructions placed in the main channel has been derived for mean river stage on the assumption that no diversions have been made by the Lake Superior Power Company or the Michigan Lake Superior Power Company. This maximum effect on lake levels has not entirely taken place, owing to these diversions by the said power companies. In treating this subject, use has been made of the incomplete-weir formula, river-discharge increments and river-gage relations. The discharge through the main channel of the St. Marys Rapids for the third to ninth periods, inclusive, for mean river stage at Southwest Pier Gage, (1871 to 1905, inclusive), 601.86, has been previously computed as 69200 cubic feet per second. The corresponding measured mean water surface at the International Bridge Section during this period of flow was 600.61. In 1902, after the compensating works of the Michigan Lake Superior Power Company were built, practically closing spans 9 and 10, the mean water surface of this section was measured as 600.98 for the same discharge, 69200 cubic feet per second. This rise of 0.37 foot in the water surface represents the swell, *h_s*, at the International Bridge Section, due to the shutting off by the compensating works of the two spans on the Canadian side of the rapids. These actual

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measurements afford a means for determining an experimental value of u in the incomplete-weir formula :

$$D = u b \sqrt{2g} \left\{ \frac{2}{3} \left[(h_s + k)^{\frac{3}{2}} - k^{\frac{3}{2}} \right] + d (h_s + k)^{\frac{1}{2}} \right\}. \quad (27)$$

where $D = 69200$ cubic feet per second, the discharge through the St. Marys Rapids, in third to ninth periods, inclusive, with mean water surface at International Bridge of 600.61, and in tenth period with mean water surface of 600.98, $b_A = 1511$ feet, width of channel after obstruction by compensating works,

$2g = 64.4$ feet per second per second,

h_s = height of swell, in feet.

$$k = \frac{V^2}{2g} = \frac{(D/A_B)^2}{2g} = 0.655 \text{ foot} = \text{theoretical velocity head previous to placing}$$

of obstruction, and where A_B is area of cross section of main channel before compensating works were built = 10650 square feet.

$$d = \frac{A_B}{b_B} = \frac{10650}{1794} = 5.937 \text{ feet} = \text{mean depth previous to construction of works,}$$

where b_B is width of channel in third to ninth periods, inclusive. Substituting these values in the above equation and solving gives a value for u of 0.899. The building of the piers and approaches of the International Bridge, according to computations, reduced the discharge through the main channel from 82280 to 77200 cubic feet per second, decreased the channel width from 2383 to 2232 feet, and changed the cross-sectional area from 13690 to 12490 square feet. Substituting these values in the incomplete-weir formula and using the experimental value of u (0.90) gives the swell, h_s , at the bridge site, due to the construction of the piers and approaches, as 0.183 foot. The corresponding rise at Southwest Pier was 0.298 foot. This latter value represents the estimated rise in mean lake level caused by the building of the International Bridge. About four years after the International Bridge was built, the Chandler-Dunbar Water Power Company shut off spans 1 and 2, on the American side, from the main channel. This obstruction reduced still more the mean discharge through the main channel. Using the incomplete-weir formula,

$$D = u b \sqrt{2g} \left\{ \frac{2}{3} \left[(h_s + k)^{\frac{3}{2}} - k^{\frac{3}{2}} \right] + d (h_s + k)^{\frac{1}{2}} \right\}$$

for determining the effect of building the bridge piers and approaches and closing spans 1 and 2, where $D = 82280$ cubic feet per second, discharge at mean river level, 601.86, under original conditions,

$u = 0.90$, experimental coefficient for present case,

$b_A = 1794$ feet, width of channel after obstructions were built,

$2g = 64.4$ feet per second per second,

$$k = \frac{V^2}{2g} = \frac{(D/A_B)^2}{2g} = 0.562 \text{ feet, theoretical velocity head previous to placing of}$$

obstructions, where A_B is area of cross section of main channel before structures were placed = 13690 square feet.

$$d = \frac{A_B}{b_B} = 5.745 \text{ feet} = \text{mean depth before structures were placed, where } b_B =$$

2383 feet,

and solving for h_s gives 0.496 foot as the swell at the Bridge Section due to the construction of these works. The discharge formula for the flow through the main channel of the rapids, after the bridge piers and approaches were built and spans 1 and 2 were closed, according to 1896 measurements, is: $D_{\text{RAPIDS 3-9}} = 17880$ (Southwest Pier Gage - 600.00) + 35995, while that after the com-

pensating works were built, according to the 1902 measurements, is: $D_{\text{RAPIDS } 10} = 15540$ (Southwest Pier Gage -600.00) $+30510$. The increment at Southwest Pier Gage, as determined in 1896 and 1902, is 17880 and 15540, respectively, while that at the Bridge Section for the 1896 conditions was unknown, and for 1902 was 22600. In order to determine the increment at the bridge, under the 1896 conditions, the assumption has been made that the increments of discharge per foot rise under the same efflux conditions are directly proportional for various points in a stream. This proportion is: Increment Southwest Pier₁₀: increment Southwest Pier₃₋₉ :: increment Bridge₁₀ : increment Bridge₃₋₉ or, inserting values, 15540 : 17880 :: 22600 : X. Solving: X=26000. The difference between the discharge through the main channel in the rapids for the first period and the third-ninth period is $82280 - 69200 = 13080$ cubic feet per second. This quantity represents the volume of water cut off by the construction of the bridge piers and approaches and closing of spans 1 and 2. Since 1 foot rise at the bridge, under original conditions, is equivalent to an increase in discharge of 26000, then the swell caused by these obstructions, involving a reduction in discharge of 13080 cubic feet per second, is $\frac{13080}{26000} = 0.503$ foot. The swell at the bridge, due to the building of the piers and approaches for the International Bridge, the shutting off of spans 1 and 2 by the Chandler-Dunbar Water Power Company, and the closing of spans 9 and 10 by the construction of the compensating works, computed by the incomplete-weir formula, is 0.817 foot. Subtracting 0.37 foot, the actual measured swell due to the building of the compensating works, gives 0.447 foot as the swell at the Bridge Section due to the building of the piers and approaches of the International Bridge and the shutting off of spans 1 and 2.

52. Summarizing: The swell at the Bridge Section, due to the construction of the piers and approaches and shutting off of spans 1 and 2, is:

Incomplete weir (direct).....	0.496 foot
Increment.....	.503 foot
Incomplete weir (indirect) 0.817 — 0.370.....	.447 foot
Mean swell.....	.482 foot

53. The above value represents the swell at the bridge due to these obstructions, but it does not represent the true effect on the St. Marys River at Southwest Pier. Since the increment of discharge at Southwest Pier is 17880, the swell at that point, due to decreasing the discharge through the rapids by 13080, is $\frac{13080}{17880} = 0.732$ foot. By water-surface relations between Southwest Pier and mean water surface at Bridge, it is found that for mean river stage (601.86) at Southwest Pier, the corresponding mean water surface at Bridge is 600.613. Adding 0.482 foot, the mean swell at the bridge due to the construction of the piers and approaches and shutting off of spans 1 and 2, gives 601.095 as the new mean water surface. The gage reading at Southwest Pier, corresponding to this mean water surface at the bridge, is 602.645. The difference between 602.645 and 601.86 is 0.785, the swell due to building these obstructions.

54. Summarizing: The swell at Southwest Pier, due to building the piers and approaches for the International Bridge and shutting off of spans 1 and 2, is:

Increment method.....	0.732 foot
Gage relations.....	.785 foot
Mean.....	.758 foot

55. During the period immediately following the building of the compensating works, the mean water surface at the Bridge Section was 600.54 for mean river stage. The rapid's discharge, corresponding to this gage height, was

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59300 cubic feet per second. The difference between the mean rapid's discharge before and after the building of these works is computed to be $69200 - 59300 = 9900$ cubic feet per second. The increment of discharge at the bridge, as determined by measurement, was 22600. From these data, the swell at the bridge is computed to be $\frac{9900}{22600} = 0.439$ foot. Actual measurements taken before and after the compensating works were built give the swell at the bridge as 0.37 foot.

56. Summarizing: The swell at the Bridge Section, due to the construction of the compensating works, is:

Increment (direct).....	0.439 foot
Actual measurement.....	.370 foot
Incomplete weir (indirect, 0.817 — 0.482).....	.335 foot
Mean.....	.381 foot

57. The swell at the southwest pier for this period, computed by the increment method, is $\frac{9900}{15540} = 0.638$ foot, while by gage relations it was 0.648 foot. The mean of these two values gives 0.643 foot as the rise in the mean river stage at the southwest pier, due to the compensating works.

58. SUMMARY. The mean stage of St. Marys River at the southwest pier, from 1871 to 1905, inclusive, is 601.86. The effect of the building of the piers and approaches to the International Bridge and the shutting off of spans 1 and 2 on the American shore by the Chandler-Dunbar Water Power Company was to raise the mean river level at the southwest pier 0.758 foot, or to an elevation of 602.618. The effect of the construction of the compensating works on the mean river level at Southwest Pier was to raise it 0.643 foot, or to a new mean river stage of 603.261. The mean water surface at the International Bridge, after the compensating works were built, corresponding to 603.261 at Southwest Pier, was 601.423 feet. Subtracting from this value the swell at the bridge, due to the compensating works, namely, 0.381 foot, gives the mean water surface at the bridge, before the compensating works were built, as 601.042. Subtracting from this new value 0.482 foot, the swell at the Bridge Section due to the construction of the piers and approaches to the International Bridge, and the shutting off of spans 1 and 2 from the main channel, gives 600.56 as the original mean water surface at the Bridge Section. The effect of placing obstructions in the St. Marys River at or near the International Bridge site has been to raise the mean level of the river at the bridge and Southwest Pier, and also the mean level of Lake Superior. If no diversions from the upper river had occurred, the ultimate rise in the mean level of the St. Marys River and Lake Superior would have been approximately 1.40 feet; but, owing to diversions having taken place, this rise has been diminished.

ST. CLAIR RIVER DISCHARGE.

59. During the period from April, 1899, to September, 1902, inclusive, the United States Lake Survey measured the discharge of the St. Clair River, the outlet to Lake Huron, in the vicinity of Port Huron, Mich. These measurements have been used in deriving a formula for the flow of this river in terms of G.T.R. and Dry Dock gage heights. The elevation of the crest of the submerged weir has been assumed at 543 feet above mean sea level. The St. Clair River discharge formula, as derived, is:

$$D = \left(\frac{C_{G.T.R.} + C_{D.D.}}{2} \right) F^{\frac{1}{2}} \left(h_v + \frac{h_d}{2} \right) \quad (28)$$

in which the coefficients depending on the stage at G.T.R. and Dry Dock, derived from the discharge measurements, are:

$$C_{G.T.R.} = \frac{2700.316}{\frac{62.871}{h_U} - 1}, \text{ and } C_{D.D.} = \frac{2766.21}{\frac{61.982}{h_D} - 1} \text{ respectively.}$$

60. This discharge equation of the St. Clair River, depending on the gage readings at G.T.R. and Dry Dock, has been transformed to one depending on G.T.R. and St. Clair Flats, on account of the long series of readings taken at the St. Clair Flats Canal. In order to substitute the St. Clair Flats Canal readings for Dry Dock readings in the discharge formula, the following equation was used: (Fall, G.T.R. to St. Clair Flats Canal) = 7.4482 (Fall, G.T.R. to Dry Dock) - 1.9657. The St. Clair River discharge formula, as transformed, is:

$$D = \frac{C_{G.T.R.} + C_{ST. CLAIR FLATS CANAL}}{2} F^{\frac{1}{2}} \left(h_U + \frac{h_D}{2} \right). \quad (29)$$

The coefficients derived in this transformed equation are:

$$C_{G.T.R.} = \frac{1308.339}{\frac{64.674}{h_U} - 1}, \text{ and } C_{ST. CLAIR FLATS CANAL} = \frac{1445.118}{\frac{59.123}{h_D} - 1}.$$

61. This last equation, expressed in terms of St. Clair Flats and G.T.R., has been used to compute the mean discharges of St. Clair River from 1860 to 1907, inclusive.

62. In 1900, the Chicago Drainage Canal began diverting water from Lake Michigan. The quantity used from 1900 to June, 1904, inclusive, has been computed from data furnished the Commission by the United States Engineer Office at Chicago. The flow through the canal for the last half of the year 1904, and 1905, 1906 and 1907, has been assumed to be the quantity authorized in the permit of the Secretary of War.

DETROIT RIVER DISCHARGE.

63. The Detroit River discharge equation has been derived from measurements taken at Fort Wayne, Mich., by the United States Lake Survey during the summers of 1901 and 1902. The elevation of the crest of the weir is assumed as 540 feet above mean sea level. A part of these observations were rejected owing to the fluctuation in the level of water at Amherstburg during the discharge measurement. The remaining discharges were used in determining the discharge equation. The discharge formula, as derived, is:

$$D_{DETROIT} = \frac{C_{W. PT.} + C_{AMH.}}{2} F^{\frac{1}{2}} \left(h_U + \frac{h_D}{2} \right). \quad (30)$$

in which $C_{W. PT.}$ for the upstream head at Windmill Point = $\frac{1174.5}{\frac{52.248}{h_U} - 1}$,

$C_{AMH.}$ for the downstream head at Amherstburg = $\frac{2052.9}{\frac{60.083}{h_D} - 1}$,

F = fall, Windmill Point to Amherstburg,

h_U = upstream head on crest of submerged weir, determined by Windmill Point gage heights,

h_D = downstream head on crest of submerged weir, determined by Amherstburg gage heights.

64. Owing to the lack of sufficient observations, no winter discharge formulae have been derived for the Detroit or St. Clair Rivers. It is, undoubtedly, true

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that for the same slope the discharge is less with an ice covering than without one, on account of the increased friction.

Ice gorges occur in the St. Clair and Detroit rivers nearly every winter, creating an abnormal slope in the river that is gorged. Under such conditions, the discharge value computed from the river not gorged, has been used as the correct monthly mean inflow to Lake Erie.

65. The monthly mean discharge values of the Detroit River from January, 1860, to December, 1907, inclusive, are given in Table 20.

NIAGARA RIVER DISCHARGE.

66. The discharge of the Niagara River has been determined by measurements taken at the International Bridge, located at Buffalo, N.Y., and at a point about 1,800 feet down stream at the "Open Section." These observations were begun in 1897 under the direction of E. E. Haskell, Engineer for the United States Deep Waterways Commission. At the conclusion of this work, the United States Lake Survey continued the measurements in 1898, 1899, and 1900. These measurements have been reduced on the assumption that the outlet of Lake Erie is a submerged weir with a broad, flat crest, whose upper nappe is about one mile in length and the lower one about two, with the crest section at or near the Buffalo Waterworks' Intake Pier. The Niagara River discharge formula, as derived, is:

$$D_{\text{NIAGARA}} = CbF^{\frac{1}{2}} \left(h_u + \frac{h_d}{2} \right). \quad (31)$$

in which F = fall from Buffalo Breakwater Light-house, in Lake Erie, to Austin Street, in Niagara River,

h_u = upstream head on crest of submerged weir, determined by Buffalo Breakwater Light-house gage,

h_d = downstream head on crest of submerged weir, determined by Austin Street gage,

$C = -0.02458h_u + 2.550$,

556.35 = the average elevation of the crest of the weir above mean tide at New York,

b = width of crest section, at Waterworks' Intake, which is determined as follows: Compute the mean fall in the Niagara River from Buffalo Breakwater Light-house to Austin Street, according to the formula, $F = 0.02976X^2 - 0.4896X + 6.5828$, in which X = Lake Erie stage at Buffalo Breakwater Light-house gage above elevation 560 feet. Substitute this value for fall, or the actual fall between these two points in the equation, (Fall, Buffalo Breakwater Light-house to Waterworks' Intake = 0.4916 (Fall, Buffalo Breakwater Light-house to Austin Street) + 0.6553 , and solve for fall from Buffalo Breakwater Light-house to Waterworks' Intake Section. Determine the corresponding stage of water at Waterworks' Intake Section by subtracting the fall from Buffalo Breakwater Light-house to Waterworks' Intake Section from Lake Erie stage as measured at Buffalo Breakwater Light-house. Then substitute in the equation, $b = 80$ (Waterworks' Intake stage above mean tide at New York) - 43598 , and solve for the width of the crest section.

The monthly mean discharge values of the Niagara River, from January, 1860, to December, 1907, inclusive, are given in Table 21.

ST. LAWRENCE RIVER DISCHARGE.

67. The St. Lawrence River discharge formula has been determined from discharge measurements made by the United States Lake Survey in 1901 and 1902 at "Three Points Section," situated about 15 miles below Ogdensburg, N.Y., and 9 miles below the head of the Galop Rapids. During the measurements, no

simultaneous gage readings were observed at Lock 27. Since the discharge equation is expressed in terms of Ogdensburg and Lock 27 gage heights, the latter have been computed for each measurement according to the equation, $(\text{Ogdensburg} - 240) = 0.0006489 (\text{Lock 27} - 240)^2 + 0.97085 (\text{Lock 27} - 240) + 1,3502$, which was derived from simultaneous monthly mean readings taken at the two places. This method was deemed most accurate, for, during the months when observations were taken, the slope between Ogdensburg and Lock 27 approximated very closely the mean slope computed by the above formula. It has been assumed that the submerged weir lies between Ogdensburg and Lock 27, near the head of the Galop Rapids, and the mean elevation of the crest of this weir is 230 feet above mean sea level at New York. The discharge equation, as deduced for summer flow, May to November, inclusive, before the Gut channel at the Galop Rapids was closed, is:

$$D_1 \text{ (SUMMER) ST. LAWRENCE} = \frac{C_{og.} + C_{27}}{2} F^{\frac{1}{2}} \left(h_u + \frac{h_D}{2} \right). \quad (32)$$

in which $C_{og.}$, for the upstream head measured at Ogdensburg self-registering gage,

$$\text{is} = \frac{111430.485}{\frac{h_u}{152.389} + 1},$$

$$C_{27}, \text{ for the downstream head, measured at Lock 27, is} = \frac{54597.508}{\frac{h_D}{59.445} + 1},$$

F = fall, Ogdensburg to Lock 27,

h_u = upstream head on crest (elevation 230) of submerged weir, determined by Ogdensburg gage height,

h_D = downstream head on crest (elevation 230) of submerged weir, determined by Lock 27 gage height.

68. The slope in the river, from Oswego and Ogdensburg to Lock 27, increases in the winter, due to the ice covering, which causes increased friction with the water and decreases the discharge for a given stage. The average increase in fall for the winter season, between Lock 27 and Ogdensburg, has been determined as 0.31 foot. For any given stage at Lock 27, with mean summer slope to Ogdensburg, the discharge of the St. Lawrence River can be derived by formula (32). With this known river discharge and stage at Lock 27, and with Ogdensburg gage heights increased by 0.31 foot for average winter conditions, a solution for C in the submerged-weir formula has been made. This operation was repeated so as to cover the range in stage at these two gages.

69. The winter discharge equation, as deduced, covering the period from December to April, inclusive, and before the Gut channel at the Galop Rapids was closed, is:

$$D_1 \text{ (WINTER) ST. LAWRENCE} = \frac{C_{og.} + C_{27}}{2} F^{\frac{1}{2}} \left(h_u + \frac{h_D}{2} \right), \quad (33)$$

in which $C_{og.}$, for the upstream head, measured at Ogdensburg self-registering

$$\text{gage in the winter season, is} = \frac{131202.913}{\frac{h_u}{206.737} + 1},$$

C_{27} , for the downstream head, measured at Lock 27 in the winter season,

$$\text{is} = \frac{53597.993}{\frac{h_D}{67.401} + 1},$$

F = fall, Ogdensburg to Lock 27,

h_u = upstream head on crest (elevation 230) of submerged weir, determined by Ogdensburg gage heights,

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h_D = downstream head on crest (elevation 230) of submerged weir, determined by Lock 27 gage heights.

70. As previously stated, the winter months have been considered as December to April, inclusive. During many of these months, ice gorges have occurred in the river, above the Galop Rapids, which conditions have invalidated the winter-slope relation and caused abnormally high discharge values. Fortunately, below the Galop there are two more submerged weirs, one at the head of Rapide Plat, near Lock 24 on the Morrisburg Canal, and the other at the head of the Long Sault Rapids, near Lock 21 on the Cornwall Canal, at which points water-level observations have been made by the Canadian Government for many years.

71. Owing to lack of data, the Commission has been unable to derive a submerged-weir formula for the St. Lawrence River discharge based on the stage of water at the Rapide Plat and Long Sault Rapids, and has used the overfall-weir formula derived by the United States Lake Survey for these two locations, and has also used in a few instances the overfall-weir formula in terms of Lock 27, when ice gorges occurred at Lock 24 and Lock 21 and the slope in the river above the Galop was abnormal.

72. These discharge equations for the St. Lawrence River flow are:

$$D_{27 \text{ ST. LAWRENCE}} = 5732 (2.80 + h_{27})^{\frac{3}{2}}, \quad (34)$$

$$D_{24 \text{ ST. LAWRENCE}} = 16.60 (22.10 + h_{24})^{2.8}, \quad (35)$$

$$D_{21 \text{ ST. LAWRENCE}} = 316.0 (8.30 + h_{21})^{2.3}, \quad (36)$$

where h_{27} , h_{24} , and h_{21} are the gage readings above the old lock sill of each lock as zero.

73. In determining the monthly mean discharge of the St. Lawrence River for January, February, and March, from 1870 to 1907, inclusive, values have been deduced according to the submerged-weir and the three overfall-weir formulæ. The minimum result in each case has been used as the most reliable value.

74. In 1903, the Canadian Government began work on closing the Gut channel, the smallest of the three channels at the head of the Galop Rapids. The damming of this outlet decreased the discharge of the St. Lawrence River for any given stage. According to the United States Lake Survey, this change in flow has been about $5\frac{1}{2}$ per cent. less than that for the assumed original condition, January, 1860, to August, 1903, inclusive. This percentage change has been applied to the discharge equations for the period previous to September, 1903, and other discharge formulæ deduced.

75. The formula as derived for summer conditions of flow of the St. Lawrence, after the Gut channel was closed, is:

$$D_{2 \text{ (SUMMER) ST. LAWRENCE}} = \frac{C_{OG.} + C_{27}}{2} F^{\frac{1}{2}} \left(h_U + \frac{h_D}{2} \right) \quad (37)$$

in which C for the upstream head, measured at Ogdensburg self-registering gage,

$$\text{is: } C_{OG.} = \frac{104112.068}{\frac{146.326}{h_U} + 1},$$

$$C \text{ for the downstream head, measured at Lock 27, is: } C_{27} = \frac{55685.721}{\frac{65.075}{h_D} + 1}$$

F = fall from Ogdensburg self-registering gage to Lock 27,

h_U = upstream head on crest (elevation 230) of submerged weir, determined by Ogdensburg gage heights,

h_D = downstream head on crest, determined by Lock 27 gage heights.

76. The St. Lawrence River winter discharge formula, after the Gut channel was closed, as deduced, is:

$$D_2 \text{ (WINTER) ST. LAWRENCE} = \frac{C_{og.} + C_{27}}{2} F^{\frac{1}{2}} \left(h_u + \frac{h_D}{2} \right), \tag{38}$$

in which C for Ogdensburg self-registering gage is: $C_{og.} = \frac{135093.09}{\frac{226.492}{h_r} + 1}$,

C for Lock 27 is: $C_{27} = \frac{52177.516}{\frac{69.799}{h_D} + 1}$.

The remaining factors are the same as for summer flow.

The monthly mean discharge values of the St. Lawrence River, from January, 1860, to December, 1907, inclusive, are given in Table 22.

DISCHARGE INCREMENTS OF THE RIVER OUTLETS OF THE GREAT LAKES SYSTEM.

77. The discharge increment, or rate of change of river flow per unit change in stage, varies in the several river outlets of the Great Lakes. It is not only different for each river but it also changes with the section and the stage. In general, the increment at mean stage increases with each river lower in this series. The Detroit River increment is greater than the St. Clair; likewise, the St. Lawrence River increment is greater than the Niagara. It also increases as each river is descended. On the Niagara River, the increment at Buffalo Light-house, Buffalo, for mean stage of Lake Erie, is 23400 cubic feet per second per foot, while at Grass Island, near the intake of the Niagara Falls Power Company, at Niagara Falls, N.Y., the increment is about 43000 cubic feet per second per foot. There are exceptions to this rule when the river section is contracted. At the head of the Whirlpool Rapids, in the Niagara River, a contracted section reduces the increment to about 9000 cubic feet per second per foot. In the St. Lawrence River, contracted sections occur at the head of the Rapide Plat and the head of the Long Sault Rapids. At the former, the increment is about 22500 cubic feet per second per foot, while at Lake Ontario it is 28100 cubic feet per second per foot. Table 23 gives the discharge increments, expressed in cubic feet per second per foot change in stage, of the several river outlets of the Great Lakes.

TABLE 23.

INCREMENTS OF DISCHARGE OF THE SEVERAL RIVER OUTLETS OF THE GREAT LAKES, EXPRESSED IN CUBIC FEET PER SECOND PER FOOT CHANGE IN STAGE.

RIVER.	LOCATION OF GAGE	STAGE.	INCREMENT.
St. Marys.....	Sault Ste. Marie, Mich.....	601.91 (Mean)	18,500
		601—602	18,500
		602—603	18,500
St. Clair.....	Harbor Beach, Mich.....	581.44 (Mean)	18,900
		579—580	16,300
		580—581	17,500
		581—582	19,100
Detroit.....	Windmill Point, Mich.....	582—583	20,900
		575.40 (Mean)	20,600
		574—575	18,300
		575—576	20,900
Niagara.....	Buffalo, N.Y.....	576—577	22,500
		572.67 (Mean)	23,400
		570—571	19,600
		571—572	21,400
St. Lawrence.....	Ogdensburg, N.Y.....	572—573	23,200
		573—574	25,100
		245.28 (Mean)	28,100
		244—245	26,800
		245—246	27,600
		246—247	29,300
		247—248	29,800

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SUPPLY FACTORS OF GREAT LAKES.

78. The total supply (S) of water to a reservoir or lake depends on the inflow (I) or transmitted supply from another watershed, the precipitation (P) on the surface of the lake, the run-off (R) from the lake's watershed, and evaporation (E) from the lake's surface; or the outflow or discharge (D) from and storage (s) in the lake. Of these factors, for the Great Lakes, the transmitted supply (I), the discharge (D), and the storage (s) are known singly, while the value of precipitation (P), run-off (R), and evaporation (E), is known collectively.

79. The following equation expresses the total supply to any lake:

$$S = I + R + P - E = D \pm s. \quad (39)$$

Now, $s = Ah$, where A is the area of the lake and h the depth in feet above any datum. Transposing and substituting in (39) the value of s, we have:

$$S - D = Ah \quad (40)$$

80. The following equation shows the rate of change in the depth (dh) at any instant of time (dt):

$$(S - D) dt = A dh \quad (41)$$

Integrating with respect to t and h between the limits o and t and o and h, respectively, we have:

$$(S - D) \int_o^t dt = A \int_o^h dh \quad (42)$$

$$(S - D) t = Ah \quad (43)$$

81. An inspection of equation (43) shows that when S is greater than D the lake surface is rising and the storage is increasing, when S is less than D the lake surface is falling and the storage is decreasing; and when S is equal to D the lake surface remains at the same level and there is no change in the storage.

82. The local supply (L) to a reservoir or lake has been assumed as the water-yield from its own watershed. It is also, in a series of connecting watersheds,—equal to the total supply (S) minus the transmitted supply or inflow (I) from the watersheds situated above.

83. The following equation expresses the local supply to any lake:

$$L = S - I = (D + s) - I = R + P - E \quad (44)$$

84. The known supply factors have been deduced for Lakes Superior, Michigan-Huron, Erie, and Ontario for the period of 48 years, from 1860 to 1907, inclusive. These results are shown in Tables 24, 25, 26 and 27, and Plates 2-17, inclusive.

85. For Lake Superior, the water levels at Marquette, Mich., have been assumed to represent the mean lake surface, and those at Sault Ste. Marie, Mich., (above the locks) have been used in computing the discharge of the lake's outlet. The stage readings on the first of the month for this lake and those lower in the series have been interpolated from the monthly mean readings. For Lake Michigan-Huron, the mean of the stage values for Milwaukee, Wis., and Harbor Beach, Mich., has been used for the mean lake surface. Lake St. Clair has been treated as a part of the Michigan-Huron watershed, and the Detroit River, as the natural lake outlet. Since 1900, water has been diverted from Lake Michigan through the Chicago Drainage Canal. The St. Clair River is the outlet to Lake Michigan-Huron, but, owing to the apparent changes in regimen prior to the first accurate discharge measurements in 1899, it became necessary to eliminate this river and use the Detroit, regardless of the fact that there have been many more discharge measurements of the St. Clair. The regimen of the Detroit River has, apparently, remained nearly constant during the period from 1860 to 1907,

inclusive. For Lake Erie, the water levels at Cleveland, Ohio, have been used to represent the mean lake surface, and those at Buffalo, N.Y., to govern the outflow through the Niagara River. The volume of water diverted from the natural outlet of Lake Erie through the Erie and Welland canals has been estimated at 1000 and 1100 cubic feet per second, respectively. These amounts, added to the Niagara River discharge values represent the total outflow from Lake Erie. For Lake Ontario, the Oswego, N.Y., stage readings have been assumed to represent the mean water level of the lake. During periods in the spring, when the Oswego River was at flood stage, these water levels may be slightly in error. The outflow through the St. Lawrence River has been derived from the values of the Ogdensburg and Lock 27 gage heights, used collectively, except as heretofore noted.

86. LAKE SUPERIOR SUPPLY FACTORS.—An inspection of Plates 2-5, inclusive, shows that Lake Superior had a maximum monthly mean stage of 604.08, in September, 1869, and a minimum of 600.76, in February, 1871. During the high water of 1876, Superior rose, in August, to 603.93. On several occasions, the lake level has fallen to about 601.0, or lower, as in 1879, 1880, 1892 and 1893. Since 1894, Superior has fluctuated between 601.46 and 603.54, a range of 2.08 feet, while the maximum fluctuation since 1860 has been 3.32 feet. The mean water level for the 48 years, 1860 to 1907, inclusive, was 602.32. The storage capacity of Superior is enormous, one foot depth on the lake surface being equivalent in volume to a constant inflow of 340100 cubic feet per second for one month. During the period which this investigation covers, the storage has been over +200000 cubic feet per second, for a month, on several occasions. In May, 1876, May, 1888, and May, 1899, Superior stored +207500, +212600, and +204100 cubic feet per second, respectively. In August, 1869, the lake stage increased 0.655 foot, equivalent to +222800 cubic feet per second storage. The occurrence of the maximum storage in the month of August is most unusual. At other times, the lake surface has fallen almost as rapidly. In November, 1869, November, 1870, December, 1870, December, 1871, and December, 1897, the storage was -168400, -188800, -173400, -161600, and -137700 cubic feet per second, respectively. The corresponding feet depths on lake surface are: -0.495, -0.555, -0.510, -0.475, and -0.405. For the three months of November, and December, 1870, and January, 1871, Lake Superior fell from 602.47, on November 1st, to 601.06, on February 1st, a storage of -1.41 feet. The outflow from Lake Superior through the St. Marys River has not shown the fluctuations so noticeable in the storage. In September, 1869, the river discharged 128700 cubic feet per second, and in September, 1876, 121800 cubic feet per second. These two values represent the maximum monthly mean discharge to date. On only two occasions has the monthly mean discharge fallen below 50000 cubic feet per second, and that occurred during February and March, 1893, when it reached 48200 and 48400 cubic feet per second, respectively. The total monthly mean supply or water-yield to Lake Superior has ranged between 333300 cubic feet per second, in August, 1869, and -106600, in December, 1870, equivalent to 0.980 and -0.313 foot depth on lake surface, respectively. A maximum monthly mean supply of +200000 cubic feet per second, or more, has occurred in 21 of the 48 years. A minus monthly mean supply has occurred in 42 of the 48 years. Minus values have occurred in each month between October and April, inclusive, although December has been the prevailing one.

87. LAKE MICHIGAN-HURON SUPPLY FACTORS. As shown on Plates 6-9, inclusive, the monthly mean stage of Lake Michigan-Huron has fluctuated between 583.58 and 583.60, in July, 1876, and June, 1886, respectively, and 579.00, in December, 1895, a range of 4.6 feet. Previous to 1886, the lake level had fallen

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to about 580.2, or 1.2 feet above the low water of 1895 and 1896, on only three occasions, March, 1869, March, 1872, and January and February, 1873. Since September, 1890, the monthly mean stage has not exceeded 581.5, except in July and August, 1905, and July, 1907, when it was 581.56, 581.54, and 581.56, respectively. The mean stage of Lake Michigan-Huron for the 48 years, 1860 to 1907, inclusive, was 581.38. As previously stated, in Table 1, the area of Lake Michigan-Huron is 45314 square miles. An increase in depth of one foot on this surface is equivalent to a constant inflow of 480700 cubic feet per second for one month. The storage on this lake, in May, 1873, and May, 1876, amounted to +251400 and +254800 cubic feet per second, respectively, with corresponding depths on surface of 0.523 and 0.530 foot. A monthly storage of +150000 cubic feet per second is quite common. Occasionally, the high rate of storage extends over several months, as in April, May, and June, 1876, when the average monthly increase for this period had a value of +220300, equivalent to a total change in stage of +1.37 feet in three months. On the other hand, when the lake stage had fallen, as in August, September, October, November, and December, 1871, the average monthly decrease in storage had a value of -183600 cubic feet per second, equivalent to a total decrease in stage of 1.91 feet in the five months. The minimum storage occurred in September, 1871, when it had a value of -261500 cubic feet per second, equivalent to a depth on lake of -0.544 foot. Values of -150000 to -200000 cubic feet per second have occurred frequently. The outflow through the Detroit River has ranged from about 275400, in July, 1883, to 105300, in February, 1874. The discharge of this river is dependent not only upon the stage of Lake St. Clair but also upon the fall to Lake Erie. The stage of Lake St. Clair is, in turn, dependent on the discharge from Michigan-Huron and on its outflow to Erie. A large discharge from Michigan-Huron raises Lake St. Clair quickly, while a high stage of Erie decreases the discharge of the Detroit River and raises Lake St. Clair by backwater. An increasing stage of Lake St. Clair with constant fall to Erie, or an increasing fall with the same St. Clair stage, gives increased discharge through the Detroit River.

88. Lakes Michigan-Huron and Erie do not rise and fall simultaneously. In some cases, the former will be rising and the latter falling. This is usually what occurs during the winter months of January, February, and March, and sometimes in December, April, and May. Ice gorges in the St. Clair or Detroit River hold back the water, thus depleting the supply to Erie and storing it in Michigan-Huron. When the gorge occurs in the St. Clair River, Lake St. Clair falls and the slope to Lake Erie becomes less than normal and that to Michigan-Huron greater. When the gorge occurs in the Detroit River, Lake St. Clair rises and the slope to Michigan-Huron is less than normal and that to Erie greater. If ice gorges of the same intensity should occur in the St. Clair and the Detroit rivers, simultaneously, Lake St. Clair would probably not indicate the gorged condition, since the discharge increments of the two rivers would be decreased and the lake would remain at its normal level. By an inspection of the hydrograph of the Great Lakes, as shown on Plate 1, the effect of ice gorges in the St. Clair and Detroit rivers is seen. Attention is called particularly to the following months as indicating large gorges in the St. Clair River: February, 1865; March, 1877; January, 1884; February, 1886; April, 1901, and February, 1902. In each case, the stage of Lake St. Clair dropped and Michigan-Huron rose. Large ice gorges in the Detroit River occurred in January, 1870, December, 1876, December, 1880, January, 1889, and February, 1895. This fact is substantiated by the extreme rise in Lake St. Clair and by the fall in Lake Erie. The total monthly mean supply to Lake Michigan-Huron has fluctuated between +470800 cubic feet per second, in June, 1883, and -32000 cubic feet per second, in September, 1871, equivalent to a depth on the lake of +0.979 and -0.067 foot, respectively. In May, 1873, and May and June, 1876, the total supply exceeded

+450000 cubic feet per second. In 10 of the 48 years, the monthly supply has been over +400000 cubic feet per second. Monthly values of +350000 cubic feet per second have occurred in over 60 per cent of the years. Other months show a total supply of less than +25000 cubic feet per second in many of these years. In April and May, 1873, May, 1876, and June, 1883, the local supply to Michigan-Huron was +373000, +365100, +356400, and +389100 cubic feet per second, respectively, corresponding to depth on lake of 0.776, 0.759, 0.741, and 0.809 foot, respectively. In September, 1871, the lake lost by evaporation 125700 cubic feet per second more than the actual precipitation on the lake surface and run-off of the tributary watershed. During the months from August to December, inclusive, a minus local supply has been common, in some cases extending over several months. From August to December, 1894, inclusive, evaporation on the lake surface exceeded the precipitation on the lake surface and run-off from the tributary watershed, and the stage of Lake Michigan-Huron dropped 1.3 feet.

89. LAKE ERIE SUPPLY FACTORS. The monthly mean stage of Lake Erie (see Plates 10-13 inclusive), during the period covered in this report, has risen to 574.52, in June, 1876. The minimum stage occurred in February, 1902, when Erie fell to 570.63. During the latter month, an extensive ice gorge occurred in the St. Clair River, which explains the extreme low stage of Erie at that time. Prior to that time, the minimum stage of Erie occurred in November, 1895, when it fell to 570.70. The monthly mean level has fluctuated through an extreme range of 3.89 feet, while the annual mean oscillation in lake level has been 2.53 feet. The mean stage of Erie, from 1860 to 1907, inclusive, was 572.60. The amount of storage, for a rise of one foot in the level of Lake Erie, is equivalent to a flow of 105700 cubic feet per second for one month. On but one occasion has the storage exceeded +100000 cubic feet per second. In April, 1873, it had a value of +103600, equivalent to a depth on lake surface of 0.98 foot. During the month of January, 1865, the storage reached a minimum of -52900 cubic feet per second, corresponding to -0.50 foot on lake surface. A value nearly as small as the latter occurred in November, 1903, when the storage had a value of -49700, equivalent to -0.47 foot. The maximum monthly mean discharge from Lake Erie, 257800 cubic feet per second, equivalent to a depth of 2.44 feet on Lake Erie, occurred in June, 1876. The minimum, 168700 cubic feet per second, equivalent to a depth of 1.60 feet on lake surface, occurred in March, 1896. Ice gorges in the Niagara River, apparently, have had comparatively little effect on the outflow from Lake Erie. The maximum total supply of +314700 cubic feet per second to Erie, corresponding to a depth of +2.98 feet on lake, occurred in April, 1861. Large positive total supply values occurred in April, 1862, April, 1873, March and April, 1876, and June, 1883. The values for the several months are: +307400, +309700, +295600, +289000, and +290300 cubic feet per second, respectively. In 16 out of the 48 years, a total monthly mean supply of +275000 cubic feet per second has been exceeded. During the five-month period from February to June, 1876, inclusive, Erie had a monthly mean total supply greater than +250000 cubic feet per second, and the stage increased 1.82 feet. At other times, the total supply has decreased to less than half the maximum. The minimum, +146900 cubic feet per second, occurred in October, 1891, and November, 1903. The supply was nearly as low in January, 1865, and October, 1895, with values of +149300 and +148500 cubic feet per second, respectively. The local supply to Erie, apparently, has been very much less than to the lakes above. In April, 1873, January and February, 1874, and May, 1892, it exceeded +100000 cubic feet per second by 10600, 3200, 21600, and 9200, respectively. Minus values occur very frequently. In many years, the last six months give a minus local supply. From June, 1884, to March, 1885, inclusive, a minus local supply occurred during the entire period

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with an average monthly value of -40400 . During this period, the lake fell from 574.14 , in June, to 571.92 , in March, a change in stage of 2.22 feet, the minimum monthly local supply to Erie of -63600 cubic feet per second, corresponding to a depth on lake surface of -0.60 foot, occurred in December, 1871. From August to November, 1867, inclusive, the monthly local supply was -57700 , -60500 , -61700 , and -56500 cubic feet per second, respectively. Collectively, these values are equivalent to a depth on Lake Erie of 2.23 feet. During September, October and November, 1874, large successive local supply values of -50600 , -56100 , and -51200 cubic feet per second, respectively, occurred, equivalent to a total depth on Lake Erie of 1.49 feet. For September, October, and November, 1884, the monthly local supply was -53100 , -57500 , and -50600 cubic feet per second, respectively. These values are, collectively, equivalent to 1.52 feet depth on Lake Erie.

90. LAKE ONTARIO SUPPLY FACTORS. Referring to Plates 14-17, inclusive, the maximum stage of Lake Ontario occurred in May, 1870, when the lake level had a value of 248.95 . In 1861, 1862, 1863, 1864, 1867, 1876, 1883, 1884, 1886, 1887 and 1890, the stage exceeded 248.00 . In November, 1895, the lake level dropped to 243.41 , which has been the minimum stage during the 48 years from 1860 to 1907, inclusive. In two other years, the stage has fallen below 244.00 . This condition occurred in January, November, and December, 1896, and January, and February, 1897. This monthly fluctuation of Ontario is greater than that in any of the other Great Lakes. The maximum range in stage is 5.54 feet. Ontario fell from 248.48 , in June, 1867, to 244.51 , in January, 1868, a change in level of 3.97 feet. The mean stage of Lake Ontario, for the period from 1860 to 1907, inclusive, was 246.19 . A foot depth on Lake Ontario is equivalent to a monthly flow of 76800 cubic feet per second. During March and April, 1873, and March, 1904, the monthly storage equalled or exceeded one foot depth on the lake surface, with corresponding storage values of $+79900$, $+96000$, and $+76800$ cubic feet per second, respectively. Twelve of the 48 years had a monthly storage of $+50000$ cubic feet per second, or more. During October and November, 1867, the minus storage exceeded -50000 cubic feet per second, the values being -53800 , and -57600 cubic feet per second, respectively. The discharge of the St. Lawrence River shows an extreme variation of about 130 per cent. This change in flow is small compared with rivers not having immense storage reservoirs at their sources. The maximum flow has been computed at 351200 and 350500 cubic feet per second, and occurred in May, 1862, and May, 1870, respectively. These values may be slightly too great on account of floods in the Oswego River causing abnormal gage readings for lake stage. These maximum discharge values have been approached in June and July, 1870, when there was little likelihood of the stage being affected by these local floods. In these two months, the flow has been computed at 344100 and 343200 cubic feet per second, respectively. The minimum flow has approximated 155000 cubic feet per second. In February, 1875, March, 1900, and February, 1902, the discharge was 157900 , 156600 , and 152200 cubic feet per second, respectively. These extreme low discharges have been caused by ice gorges in the river. The minimum outflow, not caused by ice gorges, occurred in December, 1895, and December, 1896, when the discharge was 162500 and 164800 cubic feet per second, respectively. The total supply to Ontario has fluctuated between the maximum of $+382400$ cubic feet per second, in April, 1870, and the minimum of $+154100$ cubic feet per second in February, 1875, a range of $228,300$ cubic feet per second. The equivalent depths on lake surface are 4.98 and 2.01 feet, respectively. In May, 1861, and April, 1862, the total supply was $+377400$ and $+375600$ cubic feet per second, respectively. Values of 325000 cubic feet per second have occurred in 17 of the 48 years. Since May, 1893, the total monthly supply has exceeded $+300000$ cubic feet per second in but two years,

1903 and 1904. In 10 of the 48 years, the yield, or total supply, varied between +155000 and +175000 cubic feet per second during some months of the winter season. The Ontario local supply had a maximum of +151800 cubic feet per second, in April, 1870. In January, 1881, the minimum value of -34300 cubic feet per second occurred. In 7 years, the monthly mean local supply exceeded +125000 cubic feet per second. In 17 of the 48 years, it exceeded +100000 cubic feet per second. Minus values occurred frequently. The prevailing months for such values have been November, December, January, and February, although a minus local supply has occurred during all the months from August to February, inclusive.

MEAN MONTHLY SUPPLY FACTORS OF GREAT LAKES.

91. The mean monthly supply factors covering the period from 1860 to 1907, inclusive, have been derived from the monthly mean supply values of the several lakes for the 48-year period. Table 28 and Plate 18 give the results in numerical and graphical form. These curves show the mean monthly condition on Lakes Superior, Michigan-Huron, Erie, and Ontario. From Plate 18, Table 29, has been compiled, which shows the approximate date of maximum and minimum mean monthly values of stage, storage, outflow, total supply, and local supply of Lakes Superior, Michigan-Huron, Erie, and Ontario.

TABLE 29.

DATE OF MAXIMUM AND MINIMUM VALUES OF MEAN MONTHLY SUPPLY FACTORS OF THE GREAT LAKES.

LAKE.	STAGE.	STORAGE.	OUTFLOW.	TOTAL SUPPLY.	LOCAL SUPPLY.
Superior, maximum.....	Sept. 20	May 20	Sept. 1	May 25	May 25
Superior, minimum.....	Mar. 20	Dec. 10	Mar. 15	Dec. 15	Dec. 15
Michigan-Huron, maximum.....	July 20	May 5	Aug. 1	May 10	May 5
Michigan-Huron, minimum.....	Feb. 1	Nov. 1	Feb. 20	Nov. 10	Oct. 25
Erie, maximum.....	June 25	Apr. 5	July 5	Apr. 20	Apr. 5
Erie, minimum.....	Feb. 10	Oct. 1	Feb. 20	Oct. 10	Oct. 1
Ontario, maximum.....	July 1	Apr. 5	July 1	May 5	Apr. 25
Ontario, minimum.....	Dec. 10	Sept. 5	Feb. 10	Jan. 20	Sept. 25

92. The mean monthly stage cycle on Lake Superior has fluctuated between 602.79, in September, and 601.77, in March, a change of 1.02 feet. A plus storage has occurred during the months of April to September, inclusive, while a minus storage has occurred during the months of October to March, inclusive. The maximum mean monthly storage has been 95900 cubic feet per second, while the minimum has been -91100. The discharge, or outflow, has increased from March 15th, to September 1st, while it has decreased from September 1st, to March 15th. The mean monthly outflow has ranged between 92800 and 68000 cubic feet per second. The total supply has increased values from December to May, and has decreased values from May to December. The mean monthly total supply has had a maximum value of 175700 cubic feet per second, and a minimum value of -10700 cubic feet per second. This minus value, which occurs in December, shows conclusively that the evaporation from Superior may be greater than the precipitation on lake surface and run-off from its watershed. The mean monthly supply, to Superior, in January, has been only 2300 cubic feet per second, which proves that evaporation on lake surface is nearly equal to the precipitation on lake surface and run-off from the tributary watershed for that month.

93. The mean monthly stage of Lake Michigan-Huron has fluctuated between 581.90, in July, and 580.93, in January and February, a range of 0.98 foot. The storage on Michigan-Huron has been positive from February to July,

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inclusive, while it has been negative from August to January, inclusive. The maximum and minimum mean monthly storage values have been +132300 and -112200 cubic feet per second, respectively. The mean monthly outflow through the Detroit River has fluctuated from 219700, in August, to 175600 cubic feet per second, in February. This minimum discharge value is probably too large. The mean monthly total supply has had a maximum value of +337700 cubic feet per second in May, and a minimum value of +96200, in November. The mean monthly local supply to Michigan-Huron has fluctuated between +257800 cubic feet per second, in May, and +8200 cubic feet per second, in October. During October and November, the local supply has been so small that the evaporation from the lake surface has been about equal to the precipitation on lake surface and run-off from the tributary watershed.

94. The mean monthly stage on Lake Erie has ranged from 573.24, in June, to 572.03, in February, a fluctuation of 1.21 feet. The storage on Erie has had a positive value from February to June, inclusive, and a negative value from July to January, inclusive. The mean monthly storage has had a maximum value of +44100 cubic feet per second, in April, and a minimum value of -31100 cubic feet per second, in September. The outflow has fluctuated between 225700 cubic feet per second, in July, and 198100 cubic feet per second in February. The mean monthly total supply has had a maximum value of +255700 cubic feet per second, in April, while it has fallen to a minimum value of +179200 cubic feet per second, in October. The mean monthly local supply on Erie has had a positive value from January to June, inclusive, and a negative value from July to December, inclusive. During these last six months, July to December, inclusive, the evaporation on the surface of Lake Erie has been greater than the precipitation on the lake surface and run-off from the tributary watershed. The maximum mean monthly supply local of +56100 cubic feet per second occurred in April, while the minimum of -31800 cubic feet per second occurred in October.

95. The mean monthly stage of Lake Ontario has ranged from 246.95, in June, to 245.57, in December, a fluctuation of 1.38 feet. The storage has shown a positive value from January to June, inclusive, and a negative value from July to December, inclusive. The mean monthly storage has had a maximum value of +34800 cubic feet per second, in April, and a minimum value of -28700 cubic feet per second, in September. The mean monthly outflow through the St. Lawrence River has fluctuated between 283600 cubic feet per second, in July, and 219300 cubic feet per second, in February. The mean monthly total supply has had a maximum value of +297500 cubic feet per second, in May, and a minimum value of +225500 cubic feet per second, in January. The mean monthly local supply to Ontario has ranged from +83800 cubic feet per second, in April, to +18000 cubic feet per second, in September.

96. The maximum mean monthly stage of each lake of the Great Lakes has occurred at different times in the different lakes. This has been equally true with respect to the minimum stage. The maximum discharge of any lake does not occur at the time of the maximum total supply. The minimum discharge of any lake does not occur at the time of the minimum total supply. The maximum local supply of any lake does not occur at the same time as the maximum total supply; neither does the minimum local supply of any lake occur at the same time as the minimum total supply.

97. Table 30 shows the ratios, $R_{MAX.}$, between the maximum value of mean monthly discharge and the maximum value of mean monthly total supply for each lake in the system; the time interval in days, $T_{MAX.}$, which elapsed between the date of the occurrence of the maximum value of mean monthly total supply to any lake and that of the maximum value of mean monthly dis-

charge from that lake ; and the time interval, in days, $T_{MIN.}$, which elapsed between the date of the occurrence of the minimum value of mean monthly total supply to any lake and that of the minimum value of mean monthly discharge from that lake.

TABLE 30.
RATIOS— $R_{MAX.}$, $T_{MAX.}$, and $T_{MIN.}$

LAKE.	$R_{MAX.}$	$T_{MAX.}$	$T_{MIN.}$
Superior	0.524	98 days	91 days
Michigan-Huron	0.647	82 days	101 days
Erie	0.884	76 days	132 days
Ontario	0.955	56 days	20 days

98. The ratio, $R_{MAX.}$, increases with each succeeding lake in the Great Lakes system. The maximum mean monthly outflow from Superior has been about 52 per cent. of the maximum mean monthly total supply of that lake, while the maximum mean monthly outflow from Ontario has been about 96 per cent. of the maximum mean monthly total supply to that lake.

99. In order that a comparison of the several supply factors of the several lakes can be intelligently made, part of the data given in Table 28 has been expressed in cubic feet per second per square mile of watershed. Table 31 gives the mean monthly values of storage, outflow, and total supply of Lakes Superior, Michigan-Huron, Erie, and Ontario in terms of the total watershed area, including lake surface, above the lake's outlet, and of local supply of the same lakes in terms of the tributary local watershed area including lake surface. An inspection of this table shows that the mean monthly outflow from these several lakes of the Great Lakes system has been remarkably uniform. The maximum value for Superior has been 1.22 cubic feet per second per square mile, while the minimum value has been 0.89 cubic foot per second per square mile. The maximum value for Michigan-Huron has been 1.00 cubic foot per second per square mile, while the minimum value has been 0.80 cubic foot per second per square mile. The maximum value for Erie has been 0.89 cubic foot per second per square mile, while the minimum value has been 0.78 cubic foot per second per square mile. The maximum value for Ontario has been 0.99 cubic foot per second per square mile, while the minimum value has been 0.76 cubic foot per second per square mile.

100. The mean monthly total supply to Superior has fluctuated between 2.31 cubic feet per second per square mile and -0.14 cubic foot per second per square mile. That to Michigan-Huron has fluctuated between 1.53 cubic feet per second per square mile and 0.44 cubic foot per second per square mile. That to Erie has fluctuated between 1.00 cubic foot per second per square mile and 0.70 cubic foot per second per square mile. That to Ontario has fluctuated between 1.03 cubic feet per second per square mile and 0.78 cubic foot per second per square mile.

101. The mean monthly local supply to Superior has fluctuated between 2.31 cubic feet per second per square mile and -0.14 cubic foot per second per square mile. That to Michigan-Huron has fluctuated between 1.79 cubic feet per second per square mile and 0.06 cubic foot per second per square mile. That to Erie has fluctuated between $+1.62$ cubic feet per second per square mile and -0.92 cubic foot per second per square mile. That to Ontario has fluctuated between $+1.62$ cubic feet per second per square mile and 0.55 cubic foot per second per square mile. The average local supply to Erie is considerably less

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than that to the other lakes. This is explained in part by the southerly position of the lake in the chain, the general direction of its principal axis coinciding with the direction of the prevailing winds, its shallow depth, and errors in winter discharge values of Detroit River,—all of which tend to decrease the local supply factor.

102. A comparison of the total supply values with the outflow or discharge values, expressed in cubic feet per second per square mile, shows the regulating effect of reservoirs on stream flow. Without reservoirs, the run-off from the lake's watershed is discharged immediately, while, with reservoirs, the run-off is stored and discharged at an approximate uniform rate.

THE REGULATION OF LAKE ERIE AS PROPOSED BY THE UNITED STATES BOARD OF ENGINEERS ON DEEP WATERWAYS.

103. The United States Board of Engineers on Deep Waterways, in 1900, reported on the regulation of Lake Erie, in appendix 6 of their report. The scheme, as proposed by them, consisted of a submerged weir, with regulating sluices, at the outlet of Lake Erie near the angle in the Bird Island Pier, by which the level of the lake might be held at or near some fixed stage. The report says :

"The regulation of the level of the lake implies the maintenance of its surface at or near some fixed stage, to accomplish which the discharge must be so controlled that it will be at all times approximately equal to the difference between the supply of water to the lake and evaporation from the lake surface."

And further, in relation particularly to Lake Erie, the report states :

"To regulate the level of Lake Erie so as to maintain its surface near some fixed place of reference will require such control of the outflow through Niagara River that the storage which would naturally occur in the lake will be discharged during the first half of the year and the outflow will be diminished a like amount during the last half of the year. This modification of outflow will not materially change the total volume of discharge for any entire year and will amount to only one-fifth of the variation of discharge of the river for different years under present conditions. The effect of this modification of flow through Niagara River, on the level of Lake Ontario, will be to slightly increase the rate of rise in the spring and make the date of maximum stage a little earlier."

104. The scheme of regulation, as proposed by the Board of Engineers on Deep Waterways, is to not allow the monthly mean stage of Lake Erie, at Buffalo, to rise above 574.5 feet, old levels, or 574.7 feet, 1903 levels, above mean tide at New York. The minimum monthly stage of lake surface, under regulation, is not definitely stated, but it is intimated to be about 573.7 feet, 1903 levels, in the following paragraphs taken from their report :

(1) "The three months in which the supply was materially in excess of the discharge for proposed regulated stage were February, March, and April, during which the excess averaged 19000 cubic feet per second, corresponding to a rise of 0.2 foot in February, 0.2 foot in March, and 0.15 foot in April. Hence, if the level of the lake, when regulated, should be allowed to fall 0.6 foot every year after the close of navigation, it is probable that the excess of supply over discharge would never cause the surface to rise above the plane of regulation."

(2) "In the fall of 1875, the discharge of Niagara River was 60000 cubic feet per second less than the capacity of the regulating works : and, if the lake had been regulated, with the sluices of the regulating works all open, the surface would have been lowered one foot in about two months, or sufficient to have stored the excessive supply which occurred in the spring of 1876, with a margin of 0.4 foot for contingencies."

105. According to the discharge equation determined by the Board of Engineers on Deep Waterways, the maximum discharge of Niagara River was 277270 cubic feet per second, with the lake regulated at stage 574.70, 1903 levels, and the minimum discharge was 178000 cubic feet per second at stage 570.70, 1903 levels. The discharge formula of Niagara River, deducted by the International Waterways Commission, is based upon more complete data and gives the maximum discharge as 261500 cubic feet per second at 574.7, 1903 levels, and the minimum as 166700 cubic feet per second at stage 570.7, 1903 levels. In this report, the latter discharge values are used instead of those of the Board of Engineers on Deep Waterways.

PRACTICAL REGULATION OF LAKE ERIE BETWEEN STAGES
573.7 AND 574.7, 1903 LEVELS.

106. In working out a practical scheme for regulation, it is quite necessary to set a definite elevation for the regulated stage of Lake Erie at the beginning of each month. The stage values used in this investigation are given in Table 32.

TABLE 32.
STAGE OF LAKE ERIE DESIRED ON FIRST OF MONTH, WITH REGULATED
CONDITIONS.

MONTH.	STAGE DESIRED AT BEGINNING OF EACH MONTH.	MONTH.	STAGE DESIRED AT BEGINNING OF EACH MONTH.
January 1.....	573.8	August 1.....	574.0
February 1.....	573.7	September 1.....	574.0
March 1.....	573.7	October 1.....	574.0
April 1.....	573.8	November 1.....	574.0
May 1.....	573.9	December 1.....	573.9
June 1.....	574.0	January 1.....	573.8
July 1.....	574.0		

107. The maximum desired stage of water from June 1st to November 1st, inclusive, as shown in the above table, allows 0.7 foot for contingencies, which, as will be seen, is not adequate. The regulation of the elevation of the level of Lake Erie between stages 573.7 and 574.7 is a difficult proposition on account of the variation in total supply. It is impossible to estimate this factor with any degree of accuracy on account of the fluctuation of inflow, precipitation, run-off, and evaporation. This fact is very strongly brought out in the data and results shown in Table 33 and Plate 19, "Regulation of Lake Erie between stages 573.7 and 574.7." The difference between the expected total supply and the actual total supply for any one month has been as great as +47800 cubic feet per second, in April, 1891, and -40200 cubic feet per second, in April, 1892, which would have caused a difference in the expected change in stage of Lake Erie of 0.4 to 0.5 foot. In June, 1892 (see Table 33) the lake level is supposed to have reached 574.0 on the 1st of July, and regulating works are assumed to have been set to give a discharge that would bring the lake to this stage by the first of the following month, but, owing to the increase in the actual total supply over the expected total supply, the lake would have risen to 574.64, which is 0.64 foot more than the desired and estimated stage. This unlooked-for variation in a high-water year, such as 1876, might prove disastrous if the lake level were at or near stage 574.7. By examining Table 33, it is also seen that the regulated level of Lake Erie would have fallen, in most years, during some of the winter months, to 573.3, approximately, or 0.4 foot below the minimum stage set by the Board of Engineers on Deep Waterways, but would have risen above 573.7 by the opening of the season of navigation. With the proposed scheme of regulation, for the period from 1890 to 1906, inclusive, the level of Lake Erie would have risen 0.04 foot above 574.7, in June, 1892.

108. The period from 1890 to 1906, inclusive, does not include an extreme high-water year. If the proposed scheme of regulation had occurred in 1876, when the monthly mean stage of Lake Erie reached 574.5, in June, then the assumed maximum level (574.7) would have been exceeded, during April to July, inclusive, by 0.03, 0.19, 0.20, and 0.05 foot, respectively (see Table 33).

109. During the period from 1890 to 1906, inclusive, with regulation, the mean level of Lake Erie would have been raised from 572.1 to about 573.9, an increase in mean stage of 1.8 feet. During the low-water year of 1895, the mean annual level, with regulation, would have been 2.57 feet higher than the actual

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stage. The extreme low monthly mean stage of 570.71, in November, 1895, would have been raised by regulation to 573.59, an increase of 2.88 feet. The actual oscillation in monthly mean water level of Lake Erie has been about 3.89 feet. With regulation as proposed, the range of monthly mean oscillation would have been reduced to 1.43 feet during the year, and to 1.14 feet during the navigation season.

110. Perfect regulation is impossible. The monthly increase in stage of Lake Erie, with natural conditions, is frequently 0.4 to 0.5 foot ; occasionally exceeds 0.8 foot ; and has been as great as 0.98 foot. Daily oscillations in the stage are occasionally as large as 7 or 8 feet, and hourly variations sometimes exceed 2 feet. Southwesterly storms on the lake raise the water level at Buffalo and lower it at Amherstburg by several feet from the normal. This difference of level has been as large as 15 feet with the severest storms. To control this daily and hourly variation in stage of Lake Erie within small limits is impossible.

EFFECT OF REGULATION OF LAKE ERIE, BETWEEN STAGES 573.7 AND 574.7, ON WATER LEVELS OF LAKE ONTARIO AND ST. LAWRENCE CANALS.

111. The effect of the regulation of the stage of Lake Erie, between 573.7 and 574.7, on the water levels of Lake Ontario, for the period from 1890 to 1906, inclusive, is shown on Plate 20, which illustrates the increased range in stage of Lake Ontario and the detrimental effect to navigation in the St. Lawrence canals due to the proposed regulation of Lake Erie under the scheme proposed by the Board of Engineers on Deep Waterways.

PRACTICAL REGULATION OF LAKE ERIE BETWEEN STAGES 572.0 AND 574.5, 1903 LEVELS.

112. Inasmuch as it is deemed impracticable to regulate the monthly mean stage of Lake Erie between stages 573.7 and 574.7 feet above mean tide at New York, as proposed in the plan of the Board of Engineers on Deep Waterways, the investigation was continued to determine the limits between which the regulation of the monthly mean stage of Lake Erie would be practicable.

113. As in the previous plan of lake regulation, a definite elevation for the stage of the lake on the first of each month has been assumed. These values represent the limits within which it would be necessary to attempt to hold the stage of Lake Erie so that the maximum and minimum monthly mean water levels of 574.5 and 572.0, respectively, would not be exceeded. Table 34 shows the assumed elevations desired on the first of month, of the water surface of Lake Erie, for regulation of its monthly mean stage between 572.0 and 574.5.

TABLE 34.
STAGE OF LAKE ERIE DESIRED ON FIRST OF MONTH WITH LAKE REGULATED BETWEEN 572.0 AND 574.5.

MONTH.	STAGE DESIRED AT BEGINNING OF EACH MONTH.	MONTH.	STAGE DESIRED AT BEGINNING OF EACH MONTH.
January 1	572.3	August 1.....	572.5
February 1	572.2	September 1.....	572.5
March 1.....	572.2	October 1.....	572.5
April 1.....	572.2	November 1.....	572.5
May 1.....	572.3	December 1.....	572.4
June 1	572.4	January 1.....	572.3
July 1.....	572.5		

114. An inspection of Table 34 shows that 2.0 feet and 0.2 foot have been allowed for the actual fluctuations from the desired maximum and minimum monthly mean stages, respectively, of Lake Erie, with regulation. This extreme allowable fluctuation from the desired maximum is necessitated by the extreme high water of 1876, during which year the surface of Lake Erie, at Buffalo, reached a mean level of 574.49, in June, or but 0.01 foot less than the maximum monthly mean stage allowable with regulation.

115. As 1876 is the controlling high-water year, so 1895 is the controlling low-water year. Computations have been made for these two extreme years instead of for the period from 1890 to 1906, inclusive, as in the investigation of the scheme outlined by the Board of Engineers on Deep Waterways.

116. Table 35 and Plate 21 show that, with regulation, the water levels of Lake Erie, at Buffalo, differ but slightly from the actual levels for the year 1876, while for the low-water year of 1895 the annual mean level would be increased from 571.25 to 572.33, a change of +1.07 feet, and the mean level for the extreme low-water months of November and December (both in the navigation season) would be increased from 570.71 and 570.97 to 572.09 and 572.34, respectively, or a change of +1.38 feet and +1.37 feet, respectively.

EFFECT OF REGULATION OF LAKE ERIE, BETWEEN STAGES 572.0 AND 574.5, ON WATER LEVELS OF LAKE ONTARIO AND ST. LAWRENCE CANALS.

117. Any change in the outflow of Lake Erie will change the water levels of Lake Ontario. If the inflow to Ontario is increased, the lake level will rise, and with decreased inflow the level will fall. Table 36 and Plate 21 show the effect on the water levels of Lake Ontario for the years of 1876 and 1895, if Lake Erie stage had been regulated between stages 572.0 and 574.5 for those years. The effect of the regulation of Lake Erie would have been to increase the fluctuation in stage of Lake Ontario, causing higher stage in spring and lower stage in the autumn than under actual conditions.

118. For the high-water year of 1876, during which time the regulated inflow would have differed but slightly from the actual, there would have been no appreciable increase in the fluctuation in stage on Lake Ontario, and at no time during the year would the regulated stage differ from the actual by more than 0.12 foot. In 1895, however, a low-water year on Lake Ontario as well as on Lake Erie, the fluctuation would have increased with the result that during the months from September to December, inclusive, the regulated stages would have fallen to 243.70, 243.26, 243.08, and 243.33, respectively, or 0.34, 0.38, 0.33, and 0.18 foot, respectively, below the actual stages for those months.

119. During an extended period, such as from 1890 to 1906, inclusive, differences of 0.4 to 0.5 foot between the actual stage of Lake Ontario and the stage that would have prevailed under regulated conditions on Lake Erie would be of frequent occurrence. Unfortunately, these variations, with respect to actual stage, are generally negative during the period of low water and positive during the period of high water. Such conditions, caused by regulating Lake Erie, would injuriously affect navigation in the St. Lawrence canals and would decrease the draft of vessels by 0.4 to 0.5 foot, in the Galop canals, and 0.7 to 0.8 foot, in the Morrisburg canals. Barges and tows that now load to 14 feet draft would be compelled to load not more than 13.2 or 13.3 feet draft during September, October and November, in most years, and in some years during the entire season of navigation.

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EFFECT OF REGULATION OF LAKE ERIE, BETWEEN STAGES
572.0 AND 574.5, ON WATER LEVELS OF NIAGARA RIVER.

120. By the proposed system of regulation, the stage of water in the Niagara River would not fluctuate through any greater range than under actual conditions. During the winter months, more frequent low water would probably occur under regulation than under actual conditions, in which case the power companies at Niagara Falls would probably have more difficulty in keeping the channels to their intakes free from ice. During the fall months, navigation in the river might be slightly interfered with owing to the storage in the lake of a part of the natural discharge.

EFFECT OF REGULATION OF LAKE ERIE, BETWEEN STAGES 572.0
AND 574.5, ON WATER LEVELS OF LAKE ST. CLAIR, LAKE
MICHIGAN-HURON AND CONNECTING WATERS.

121. By the proposed regulation of Lake Erie between stages 572.0 and 574.5, the mean level of this lake would have been raised about 1 foot. This increase in stage would have decreased the mean slope in the Detroit River and would have caused Lake St. Clair to rise until the discharge through the Detroit River had a value equal to the discharge under natural conditions for the same period. An examination of Tables 8 and 9 shows that the mean stage of Lake St. Clair, at Windmill Point, was 575.40, and that of the lower end of the Detroit River, at Amherstburg, was 572.84. From equation 30, the discharge of the Detroit River is computed to be 204900 cubic feet per second for mean stages of 575.40, at Windmill Point, and 572.84, at Amherstburg. For this river-discharge value and with the stage at Amherstburg increased by 1.0 foot, the amount that mean level of Lake Erie would have been raised by regulation, it is found that the stage of Lake St. Clair, at Windmill Point, would eventually rise 0.61 foot. This value represents the effect on the stage of Lake St. Clair due to the increase of 1.0 foot in mean stage of Lake Erie under regulation.

122. The rise between actual and regulated low-water stage of Lake Erie would be greater than the corresponding rise between actual and regulated high-water stage. The effect of this would be to slightly lessen the discharge of the Detroit River at low stage and to slightly increase it at high stage.

123. As backwater from Lake Erie raises the water level of Lake St. Clair, so backwater from Lake St. Clair raises the water level of Lake Michigan-Huron. For a given flow in the Detroit River, an increase in the stage of Lake Erie causes an increase in the stage of Lake St. Clair; likewise, for a given flow in the St. Clair River, an increase in the stage of Lake St. Clair causes an increase in the stage of Lake Michigan-Huron. By the method used above, the effect on the water level of Lake Michigan-Huron, caused by 0.61 foot backwater on Lake St. Clair, due to the regulation of Lake Erie, has been computed to be 0.27 foot rise.

124. A study of Plate 21 shows that for a year of excessive, or above-normal supply, such as 1876, the regulation of Lake Erie would not materially improve navigation. In 1895, a year of deficient supply, the mean level during the eight-month season of navigation would have been increased from 571.31 feet, under natural conditions, to 572.41, under regulated conditions, and navigation on Erie would have been improved by an increased stage of 1.1 feet. The regulation of Lake Erie, between stages 572.0 and 574.5, would raise extreme low stage for the navigation season by at least 1 foot, without an appreciable increase in the extreme high stage. This increase in low stage is equivalent to deepening every harbor and channel in Lake Erie by that amount; in the Detroit River

and Lake St. Clair, by at least 0.61 foot ; and in the St. Clair River and Lake Michigan-Huron by at least 0.27 foot.

REGULATION OF LAKE SUPERIOR.

125. The regulation of the stage of Lake Superior has been suggested as a means (first) for improving navigation on that lake, and (second) to compensate for the diversion of water from Lake Michigan-Huron through the Chicago Drainage Canal.

126. This Commission has already recommended in its report upon the conditions existing at Sault Ste. Marie that "the level of St. Marys River, above the rapids, shall be maintained between the elevations 601.7 and 603.2 above mean tide at New York." The monthly mean stage of St. Marys River, above the rapids, has not risen above 603.2 since 1860, except in September and October, 1869, and July, August, and September, 1876. It has fallen below 601.7 on numerous occasions, generally during the winter months. In 1879 and 1891, the monthly mean stage did not exceed 601.5, while in 1892 it exceeded 601.7 in only one month. The fall in the water level of the St. Marys River above the rapids, below 601.7, for the ice months of January to April, inclusive, does not interfere with navigation on Lake Superior. The monthly mean water level of Lake Superior was below 601.7 about 20 per cent. of the navigation season (May to December, inclusive), from 1860 to 1888, inclusive. For this cycle of years, the regimen of the St. Marys River had not been materially altered by artificial works. With the completion of the International Bridge piers and approaches in 1888, and the shutting off of spans 1 and 2 of this bridge from the rapids by the Chandler-Dunbar Water Power Company, in 1892, these two principal obstructions to the natural outflow from Lake Superior have raised the water level so that it has not fallen below 601.7 more than about 2 per cent. of the navigation season from 1893 to 1907, inclusive. The difference can not be attributed to the variation in the total supply, or water-yield, to Lake Superior ; for, as a matter of fact, the average total supply for the period from 1860 to 1888, inclusive, was about 4400 cubic feet per second greater than for the period from 1893 to 1907, inclusive.

127. The construction of the compensating works at the head of the St. Marys Rapids by the Michigan Lake Superior Power Company, in 1901 and 1902, cut off a flow of about 9900 cubic feet per second. The 8500 cubic feet per second of water used by this company since 1905 nearly neutralizes the effect of these works.

128. The regulation of Lake Superior during the navigation season, between the elevations 601.7 and 603.2, as measured by the level of the St. Marys River above the rapids, has been accomplished under the conditions that did exist, and no further works seem to be necessary until a change in the artificial diversions at Sault Ste. Marie is made.

129. If the monthly mean level of Lake Superior were to be controlled during the navigation season within a smaller fluctuation than 1.5 feet, then the outflow through the St. Marys River would have to be artificially controlled. In order to eliminate the monthly mean fluctuation in large natural reservoirs, such as Lake Superior and the other lakes in this system, it would be necessary to increase the fluctuations of outflow to correspond to the fluctuations of total supply to that reservoir. To accomplish this result on Lake Superior, the monthly mean outflow would have had a maximum value of 333300 cubic feet per second, in August, 1869, and a minimum value of -106600 cubic feet per second, in December, 1870. Such fluctuations in outflow are impossible, since the minimum discharge of any stream is zero. When the total supply is minus, the level of the lake or reservoir will fall even if the outflow is entirely shut off.

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130. The question that now presents itself, since perfect regulation of Superior is impossible, is : Can the fluctuations in stage of Lake Superior be materially reduced ; and if so, what would be the effect on the lower lakes. An examination of Table 24 shows that during November and December, 1870, and January, 1871, the total monthly supply to Lake Superior for these three consecutive months was -99500 , -106600 , and -42900 cubic feet per second, respectively, equivalent, collectively, to a total depth on the lake surface of -0.732 foot. The level of Lake Superior actually fell 1.41 feet during this period, but, even if the outflow through the St. Marys River had been entirely shut off, the lake would still have fallen over eight and three-quarter inches. During May, June and July, in the high-water year of 1876, the total monthly supply to Lake Superior was 303300, 291200, and 205000 cubic feet per second, respectively—a total of 799500 cubic feet per second, equivalent to a depth on lake surface of $+2.351$ feet. The outflow through the St. Marys River for the corresponding period was 95800, 109200, and 120000 cubic feet per second, respectively, or an average monthly flow of 108300 cubic feet per second. Granting that this enormous supply of water could have been predicted—an impossibility—and that the St. Marys River could have discharged twice the average monthly outflow, or 216600 cubic feet per second, for three months, through artificial works and channels, which would be very costly to construct, Lake Superior would still have risen over $5\frac{1}{4}$ inches.

131. If the monthly oscillations in stage of Lake Superior could be materially reduced, then the monthly mean flow through the St. Marys River would fluctuate more than it actually does. Under present conditions, the outflow through the St. Marys River is the greatest during August, September, and October, when the stage of Lake Michigan-Huron is falling very rapidly. Under these natural conditions, the water from Lake Superior aids in the attempt of nature to hold the stage of Lake Michigan-Huron at a fixed elevation. If the outflow from Lake Superior in an average year were increased as much as 50 per cent., during August, September, and October, the level of Lake Michigan-Huron would be raised only about 0.1 foot per month for these months, since the discharge through the St. Marys River is not the supply factor that produces the principal effect on the stage of Lake Michigan-Huron.

132. These cases show, first, that the artificial regulation of Lake Superior would not materially decrease the present fluctuation of water level ; second, that Lake Superior is one of the best naturally regulated bodies of water in the world ; and, third, that the effect of the artificial regulation of the level of Lake Superior on the level of Lake Michigan-Huron would produce only insignificant results.

DIVERSION OF WATER THROUGH CHICAGO DRAINAGE CANAL,
THE EFFECT OF DIVERSION ON LAKES MICHIGAN-HURON, ERIE,
AND ONTARIO, AND THE REGULATION OF LAKE SUPERIOR TO
COMPENSATE FOR DIVERSION AT CHICAGO.

133. The Chicago Drainage Canal has diverted water from Lake Michigan-Huron since 1900. This has lowered the level of Lakes Michigan-Huron, St. Clair, Erie, and Ontario, regardless of the fact that these lakes are at higher stages than they were when the canal was opened. These higher stages are due to the increase in the quantity of water supplied since 1900. If this supply had not been increased, then the stages of the lakes would have been actually less. Plates 22, 23, and 24 show the monthly loss of level on Lakes Michigan-Huron, Erie, and Ontario, respectively, under the actual diversion through the Chicago Drainage Canal, and also under assumed diversions of 10000 and 14000 cubic feet per second.

TABLE 37.

LOSS OF LEVEL ON LAKES MICHIGAN-HURON, ERIE, AND ONTARIO UNDER THE ACTUAL DIVERSION AND UNDER ASSUMED DIVERSIONS OF 10000 AND 14000 C.F.S. THROUGH THE CHICAGO DRAINAGE CANAL, 1900-1907, INCLUSIVE.

LAKE.	LOSS OF LEVEL IN INCHES.		
	ACTUAL DIVERSION.	ASSUMED DIVERSION OF	
		10000 c. f. s.	14000 c. f. s.
Michigan-Huron.....	2-5/8	6-1/2	9-3/8
Erie.....	2-1/2	5-7/8	8
Ontario.....	1-7/8	4-1/4	6

134. The stage of Lake Michigan-Huron is 2⁵/₈ inches lower than it would have been if there had not been any water diverted through the Chicago Drainage Canal. Likewise, the stages of Lake Erie and Lake Ontario are 2¹/₂ and 1⁷/₈ inches lower, respectively, than they would have been with no diversion at Chicago. If the quantity of water diverted through the canal had been as much as 10000 or 14000 cubic feet per second, then the effect would have been proportionately greater.

135. Since the effect of the diversion is to lower the level of the lakes and connecting channels of the Great Lakes system, with the exception of Lake Superior and the upper St. Marys River, and as this effect will increase with the increase in the quantity of water diverted, therefore, the question presents itself: Can the present diversion or future diversions through the Chicago Drainage Canal be compensated for by the use of Lake Superior as a storage reservoir, so that the level of the lakes below Superior will not be lowered?

136. The longest low-stage period of outflow from Lake Superior has been selected in order to obtain a solution to the question. An examination of Plates 2 to 5, inclusive, shows that such a period occurred between June, 1888, and August, 1893. The average flow for the low-water year of 1892 was 65700 cubic feet per second. Assuming a continuous discharge from Superior of the average flow for that year, and, in addition, first, 4000 and, second, 14000 cubic feet per second, respectively, to compensate for a diversion of these amounts through the Chicago Drainage Canal, or a total continuous discharge of, first, 69700 cubic feet per second, and, second, 79700 cubic feet per second, respectively, between June 1, 1888, and August 31, 1893, then the regulated stages of all the lakes in the Great Lakes system would have differed materially from the actual stages. Plate 25 and Tables 38, 39, 40, 41, and 42 show these changes in stage of Lakes Superior, Michigan-Huron, Erie, and Ontario, due to regulation of outflow from Lake Superior to compensate for diversions through the Chicago Drainage Canal of 4000 and 14000 cubic feet per second.

137. To compensate for a diversion of 4000 cubic feet per second through the Chicago Drainage Canal, with the continuous discharge of water from Lake Superior of 69700 cubic feet per second between June 1, 1888, and August 31, 1893, the stage of the St. Marys River, as measured at Sault Ste. Marie (above the locks) would have been higher than it was actually. In August, 1893, the level of Superior would have returned to approximately the actual stage. Under assumed conditions, the mean stage of Lake Superior would have been increased during the period from June, 1888, to August, 1893, at the expense of the decrease in stage of Lakes Michigan-Huron, Erie, and Ontario. The cumulative effect of the constant discharge of 69700 cubic feet per second from Lake Superior during this five-year period would have been to lower the monthly mean stage of Lake Michigan-Huron from 579.88 to 579.53, and from 579.82 to 579.48, in November

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and December, 1891, respectively. These stages would have been only 0.36 and 0.48 foot higher, respectively, than the actual stages for the corresponding months of November and December in the extreme low-water year of 1895, and would have been 0.23 and 0.28 foot lower, respectively, than the mean stage for the entire navigation season of 1895, when the shipping interests were so seriously affected. This constant discharge of water from Lake Superior would also have lowered the monthly mean stage of Lake Erie from 571.21 to 570.89, and from 571.28 to 570.96, in November and December, 1891, respectively, which would have been only 0.19 and 0.10 foot higher, respectively, than the actual stages in November and December, 1895. The monthly mean stage of Lake Ontario would have been decreased by this discharge from Lake Superior from 244.44 to 244.19, and from 244.41 to 244.16, in November and December, 1891, respectively.

138. At the end of August, 1893, the water stored in Lake Superior would have been delivered to the lower lakes, and no storage water would have been available, in addition to the actual supply, to compensate for the diversion of water through the Chicago Drainage Canal, and prevent the mean levels of Lakes Michigan-Huron, Erie, and Ontario falling below the actual stages.

139. The monthly mean discharge of the St. Marys River was greater than 69700 cubic feet per second in September, October, and November, 1893. This excess would have allowed 6900, 5800, and 4800 cubic feet per second of water, respectively, to have been stored in Lake Superior in these months. The storage of this volume of water would have temporarily taken it away from the supply to Lake Michigan-Huron, and would have lowered the level of that lake temporarily. Later, when this stored water would have been discharged into the lakes below, their stages would have been the same as under natural conditions, and during the interval between the storage and discharge of this water the diversion of water through the Chicago Drainage Canal would have lowered the mean level of Lakes Michigan-Huron, Erie, and Ontario as it has under actual conditions. If the outlet were to have been artificially changed so that the St. Marys River could have discharged 4000 cubic feet per second in addition to the actual discharge, beginning with September, 1893, in order to compensate for an assumed diversion of this amount at Chicago, then it would have been only a few years before Lake Superior would have fallen so low in stage that navigation would have been seriously interfered with.

140. To compensate for a diversion of 14000 cubic feet per second through the Chicago Drainage Canal, with the continuous discharge of water from Lake Superior of 79700 cubic feet per second between June 1, 1888, and August 31, 1893, the stage of the St. Marys River, as measured at Sault Ste. Marie (above the locks) would have been lower by 1.4 feet than it was actually. This increased discharge from Lake Superior would produce the same effect on the lower lakes as the effect of the previous discharge of 69700 cubic feet per second, since the increased outflow from Lake Superior would be taken by the additional diversion through the Chicago Drainage Canal. The stage of the St. Marys River, at Sault Ste. Marie (above the locks) would have fallen, in May, 1893, to slightly below 600.0, which would have seriously interfered with the navigation of Lake Superior by the present lake vessels. At the end of this five-year period, the level of Lake Superior would have been extremely low and water would not have been available for storage in Lake Superior for the next low-water period.

141. The annual mean stage of the St. Marys River, above the locks, fell to 600.96, in 1879. This minimum value must not be taken as a criterion for permissible low water for navigation purposes; neither should it be assumed that the minimum annual mean stage on the remaining lakes, as a permanent level, would be satisfactory to navigation.

142. The artificial storage of water in Lake Superior must be commenced by shutting off the transmitted supply to the lakes below Superior in the Great Lakes system. When the stored water is allowed to flow from Lake Superior, the total supply to Lakes Michigan-Huron, Erie, and Ontario will be the same as under actual conditions, and the mean level of these lakes will remain unchanged.

143. An artificial storage of water in Lake Superior has taken place, beginning with the construction of the International Bridge and its approaches in 1888. The storing of this water in Superior has withheld it temporarily from the lakes below, and, as a result, the stages of the latter have been changed from what they would have been if there had been no artificial changes in the outlet to Lake Superior. Plates 26, 27, 28, and 29 show the monthly mean stages of the Great Lakes under actual conditions and as they would have been if no artificial works had been built in the upper St. Marys River.

144. An inspection of Plate 26 shows that the artificial storage of water in Lake Superior, created by the building in the upper St. Marys River of the International Bridge and approaches in 1888, of cutting off from the rapids the flow through spans 1 and 2 of this bridge from the American shore by the Chandler-Dunbar Water Power Company in 1892, and of building the compensating works immediately above the bridge, on the Canadian side, by the Michigan Lake Superior Power Company in 1901, has raised the monthly mean level of Lake Superior approximately 1 foot (0.966) in August, 1904. Owing to diversions of water at Sault Ste. Marie for power and other purposes, this effect is less by about 0.4 foot than the computed ultimate rise due to these obstructions. Since January, 1905, when the Michigan Lake Superior Power Company began to divert approximately 8500 cubic feet per second of water from the river for power purposes, the difference between the actual and original efflux stages has decreased to approximately 0.6 foot, a loss in level between 1904 and 1907 of 0.4 foot. Under original efflux conditions, the monthly mean level of Lake Superior would have fallen from 601.02 to 600.76, in April, 1892 ; from 601.01 to 600.82, in February, 1893 ; from 601.46 to 600.92, in March, 1898, and from 601.88 to 601.02, in March, 1903. The annual mean stage of Lake Superior, for 1904, would have been 601.84 under original conditions, while it was 602.71 under actual conditions. This artificial storage of water, due to the obstructions at the controlling section of the upper St. Marys River, partly explains why the stage of Lake Superior has been gradually rising while the stages of the lower lakes have not followed the same general upward trend.

145. The storing of water in Lake Superior has had its effect on the stage of the lower lakes. An increase in the transmitted supply from Lake Superior raises the stage of Lake Michigan-Huron an amount equal to the increase divided by the increment of discharge through the St. Clair River. The amount of additional water from Lake Superior that would have flowed into Lake Michigan-Huron between December, 1888, and December, 1904, is equivalent to the decrease in storage on Superior. This quantity represents a slice 0.87 foot thick over the entire surface of Lake Superior, equivalent to an average monthly increase in discharge of 1530 cubic feet per second through the St. Marys River between December, 1888, and December, 1904, inclusive. Under actual conditions, this increase in discharge would not be a constant quantity but would change according to the effect of the obstruction or the diversion. Plate 27 shows a comparison of the monthly mean water levels of Lake Michigan-Huron under actual and original efflux conditions of the St. Marys River. The effect of storing water in Lake Superior by the cutting off of spans 1 and 2 of the International Bridge at Sault Ste. Marie, in 1892, by the Chandler-Dunbar Water Power Company, was to lower Lake Michigan-Huron by about 0.15 foot in 1894

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and 1895. In 1896, the Lake Superior Power Company began to use water for power purposes on a large scale, which partially counteracted the effect of the obstructions. In 1902, the effect of the compensating works of the Michigan Lake Superior Power Company was to lower Lake Michigan-Huron by about 0.15 foot. In 1905, the Michigan Lake Superior Power Company began the diversion of water through their canal on the American side, which has, apparently, raised the stage of Lake Michigan-Huron about 0.1 foot, but in so doing it has been done at the expense of lowering Lake Superior by about 0.4 foot.

146. The effect on Lakes Erie and Ontario of the artificial storage of water in Lake Superior is slightly less than the effect on Lake Michigan-Huron. This decrease in effect is due to the increase in the increment of discharge of the outlets of Lakes Erie and Ontario. Plates 28 and 29 show a comparison of the monthly mean water levels of Lake Erie and of Lake Ontario, respectively, under actual and original efflux conditions of St. Marys River. While the effect of the cutting off of the flow through spans 1 and 2 from the rapids of the St. Marys River occurred about December, 1892, it was not materially felt on Lake Michigan-Huron until the latter part of 1893; not in Lake Erie until the middle of 1894, and not in Lake Ontario until the end of 1894. The effect of the construction of the compensating works at Sault Ste. Marie by the Michigan Lake Superior Power Company is also noticeable on these lakes. All the other changes in stage on Lake Michigan-Huron are faithfully reproduced on the stage of Lakes Erie and Ontario, the only difference being that they occur a little later and the effect becomes slightly less on each lake lower in the series. Where the maximum effect on Lake Michigan-Huron was about 0.15 foot, it was about 0.12 foot on Lake Erie, and about 0.10 foot on Lake Ontario.

147. The artificial storage of water in Lake Superior between December, 1888, and December, 1907, inclusive, by the placing of obstructions in the upper St. Marys River, has had the effect of raising the mean stage of Lake Superior by about 0.87 foot in 1904, and of lowering Lake Michigan-Huron, Lake Erie, and Lake Ontario by a maximum of 0.15, 0.12, and 0.10 foot, respectively. This hydraulic experiment, which has been carried on since 1888, shows that the use of Lake Superior as a storage reservoir can not be successful if navigation is to be maintained unimpaired on Lake Superior and the St. Marys River.

REGULATION OF LAKE MICHIGAN-HURON.

148. To regulate the level of Lake-Michigan Huron near some fixed plane of reference would require regulating works at or near the head of the St. Clair River. The storage in the lake, that occurs in the first part of the year, could then be discharged through these works, while the outflow from the lake during the last half of the year could be diminished by an amount equal to the negative storage. An examination of Table 28 and Plate 18 shows that the monthly mean total supply to Lake Michigan-Huron for an average year has been as great as 337700 cubic feet per second, in May, and as small as 96200 cubic feet per second, in November. Plates 7 and 6 show that the maximum and minimum monthly mean total supply has been 470800 cubic feet per second, in June, 1883, and -32000 cubic feet per second, in September, 1871, respectively. The maximum monthly mean discharge from this lake, which occurred in July, 1883, has been determined as 275400 cubic feet per second. On the basis of the above extremes for total supply, to accomplish perfect regulation of this lake would necessitate provision for a maximum outflow of 470800 cubic feet per second, and a minimum of -32000 cubic feet per second. This required maximum outflow is 195400 cubic feet per second, or 71 per cent. greater than the actual maximum. If the outflow from Lake Michigan-Huron had been entirely shut off in September, 1871, the lake would still have fallen about 0.07 foot during that

month. For the period of five months, August to December, 1871, inclusive, the average outflow from Lake Michigan-Huron, with perfect regulation, would have been only 43500 cubic feet per second ; likewise, for the period of five months, August to December, 1894, inclusive, and for the months of September, October, and November, in the low-water year of 1895, the average outflow with perfect regulation would have been only 71700 and 46600 cubic feet per second, respectively. On account of the small quantity of water that would have flowed in the St. Clair and Detroit rivers during these three periods, the stage of these rivers, of Lake St. Clair, and of Lake Erie would have been lowered several feet below the lowest known monthly water levels, and present navigation on the Great Lakes, below Lake Michigan-Huron, would have been entirely suspended.

149. These examples that have been cited show that the perfect regulation of Lake Michigan-Huron at a fixed plane of reference is not feasible even if it were possible to predict the quantity of water that nature would supply to any lake in any month.

150. The discharges of the St. Clair and Detroit rivers during the navigation season are comparatively uniform owing to the effect of the increased slopes in the rivers counteracting the effect of the decreased stages in the lakes. With the regulation of Lake Michigan-Huron, the discharge would be greatly increased during April, May, June, and July, and greatly decreased during August, September, October, and November. The latter are the critical months for the navigators. Any change in the flow of these two rivers, whereby the fluctuation in discharge would be increased, would prove a detriment to navigation.

151. Granting that the regulation of Lake Michigan-Huron could be accomplished by artificial works, the effect on the stage of water in the St. Clair River, Lake St. Clair and Detroit River would be so serious that any benefit derived from the increased depths in Lake Michigan-Huron would be more than offset by the decreased depths in the St. Clair River, Lake St. Clair, Detroit River, and the western end of Lake Erie.

152. At the present time, the stage of Lake Michigan-Huron is partially regulated by natural agencies. Nearly every winter, nature forms a regulating works in the St. Clair or Detroit river. These works consist of ice gorges, which retard the outflow from Lake Michigan-Huron, thereby storing water to be let out during the navigation season when it is so greatly needed in the lakes and connecting channels below Lake Michigan-Huron.

REGULATION OF LAKE ONTARIO.

153. To control the stage of Lake Ontario near some fixed level, regulating works could be constructed at the head of the Galop Rapids in the St. Lawrence River. These works would control the outflow from Lake Ontario and maintain the levels of the lake within definite limits. For perfect regulation, the storage in the lake must be discharged during the first half of the year and the outflow must be diminished by the amount of the negative storage during the last half of the year. An examination of Table 28 and Plate 18, shows that, for an average year, the monthly mean total supply to Lake Ontario has fluctuated between 297500 cubic feet per second, in May, and 225500 cubic feet per second, in January, while the monthly mean outflow has varied from 283600 cubic feet per second, in July, to 219300 cubic feet per second, in February. The maximum monthly mean total supply has been as large as 382400 cubic feet per second, in April, 1870, and as small as 154100 cubic feet per second, in February, 1875, while the maximum monthly mean discharge has been as large as 351200 cubic feet per second, in May, 1862, and as small as 152200 cubic feet per second,

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in February, 1902. In order to accomplish perfect regulation without enlarging the river cross section, the stage of Lake Ontario must be held at such a level that the outflow can be as great as 382400 cubic feet per second, or 31200 cubic feet per second greater than the maximum discharge to date. This required maximum outflow is only 9 per cent. greater than the actual maximum. For the low-water year of 1895, the average total supply was 185700 cubic feet per second, while the average outflow was 191600 cubic feet per second. If the oscillations in the levels of Lake Ontario are to be decreased without exceeding the extreme high water of 248.95, then the level of the lake should be held at such a stage that it will never exceed this maximum limit in months of excessive supply. Two consecutive months of excessive supply occurred in April and May, 1862, when the water-yield was 375600 and 372000 cubic feet per second, respectively. The outflow through the St. Lawrence River at regulated stage 248.95 would be about 350500 cubic feet per second. With a maximum discharge through the regulating works, there would still have been an excess in supply of 25100 and 21500 cubic feet per second, corresponding to a rise in lake surface of 0.33 foot, in April, and 0.28 foot, in May, or a total of 0.61 foot in the two months. Hence, if the level of the lake, under regulation, were allowed to fall 0.6 foot, or to 248.35, after the close of the season of navigation, then the plane of regulation of Lake Ontario would probably never be exceeded.

154. Regulating works, designed to discharge about 150000 cubic feet per second, as a minimum, and 350500 cubic feet per second, as a maximum, could be located at the head of the Galop Rapids and would control the monthly mean level of Lake Ontario between 246.95 and 248.95, a range of 2 feet. This scheme of regulation would reduce the fluctuations in lake level from $5\frac{1}{2}$ feet to within 2 feet, and would raise the mean level of Lake Ontario about 2 feet.

155. The effect on the stage of water in the St. Lawrence canals with this scheme of regulation of Lake Ontario would be to cause higher water in the first part and lower water in the last part of the navigation season. Such results would injuriously affect navigation.

COMPENSATING WORKS IN THE NIAGARA RIVER.

156. Your committee had hoped to present a discussion of a project for compensating Lake Erie for the loss of level due to diversions, by works placed above the rapids approaching Niagara Falls. A preliminary examination, however, revealed a lack of data, which prevents consideration of the question at this time.

E. E. HASKELL,
Member, American Section.

LOUIS COSTE,
Member, Canadian Section.

ATTEST : W. EDWARD WILSON, C. E.,
Secretary, American Section.

TABLE 2.
WATER LEVELS OF LAKE SUPERIOR.

Monthly mean elevations of water surface of Lake Superior, at Superior, Wis., and Marquette, Mich., in feet above mean tide at New York.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
<i>a</i> 1860	<i>b</i> 602.69	<i>b</i> 602.44	<i>b</i> 602.42	602.69	602.92	603.09	603.05	603.10	603.08	603.12	<i>b</i> 602.95	<i>b</i> 602.60	602.85
<i>a</i> 61	<i>b</i> 2.40	2.15	2.01	2.42	3.05	3.20	3.36	3.32	3.23	3.26	2.92	2.54	2.82
<i>a</i> 62	2.19	2.00	2.03	2.09	2.77	2.76	2.73	2.90	3.02	2.95	2.62	2.35	2.53
<i>a</i> 63	2.16	2.03	1.86	1.90	2.03	1.95	2.09	2.73	2.73	2.56	2.21	2.10	2.19
<i>a</i> 64	1.81	1.60	1.67	1.69	1.85	2.00	2.09	2.10	2.25	1.99	1.80	1.65	1.88
<i>a</i> 65	1.47	1.46	1.33	1.77	2.26	2.67	2.99	3.07	3.08	2.87	2.34	2.03	2.28
<i>a</i> 66	1.74	1.53	1.53	1.98	2.23	2.42	2.71	2.94	2.67	2.69	2.36	2.47	2.27
<i>a</i> 67	2.20	2.09	1.90	2.12	2.12	2.72	3.05	2.93	3.01	2.99	2.56	2.24	2.49
<i>a</i> 68	2.08	1.49	1.85	2.04	2.44	2.35	2.57	2.49	2.62	2.59	2.75	2.32	2.30
<i>a</i> 69	2.10	1.86	1.41	1.99	2.39	2.40	2.77	3.23	4.08	3.56	3.22	2.57	2.63
<i>a</i> 1870	2.32	2.11	2.12	2.22	2.55	2.36	2.55	2.55	2.72	2.56	2.38	1.45	2.32
<i>a</i> 71	1.36	0.76	1.18	1.68	2.21	2.33	2.40	2.46	2.56	2.49	2.42	1.68	1.96
72	1.47	1.36	1.24	1.14	1.79	2.17	2.44	2.61	2.77	2.67	2.52	2.22	2.03
73	2.12	<i>c</i> 1.80	<i>c</i> 1.82	<i>c</i> 1.86	2.31	2.61	2.90	3.08	3.14	3.04	2.90	2.60	2.52
74	<i>c</i> 2.14	2.13	2.09	2.19	2.26	2.46	2.84	2.93	3.03	3.09	2.91	2.60	2.56
75	2.28	2.24	2.28	2.28	2.50	2.86	2.85	2.94	3.17	3.02	2.88	2.68	2.66
76	2.48	2.27	2.18	2.21	2.75	3.43	3.82	3.93	3.82	3.49	3.33	3.05	3.06
77	2.69	2.45	2.19	2.11	2.10	2.32	2.70	2.76	2.60	2.60	2.39	2.32	2.44
78	2.20	2.32	1.55	1.52	1.79	2.07	2.14	2.02	1.85	1.92	1.72	1.40	1.88
79	<i>c</i> 1.49	1.46	1.76	1.37	1.01	1.24	1.48	1.60	1.49	1.58	1.50	<i>c</i> 1.14	1.43
1880	<i>c</i> 0.99	<i>c</i> 0.98	<i>c</i> 0.89	<i>c</i> 1.92	<i>c</i> 1.52	2.30	2.45	2.44	2.44	2.39	2.33	2.07	1.89
81	1.81	1.71	1.62	1.53	1.83	2.27	2.33	2.38	2.61	2.95	2.88	2.60	2.21
82	2.25	2.00	1.89	1.81	1.97	1.99	2.44	2.56	2.60	2.43	2.41	2.22	2.21
83	1.99	1.70	1.70	1.95	1.96	2.06	2.31	2.33	2.29	2.09	1.94	1.83	2.01
84	<i>c</i> 1.80	<i>c</i> 1.63	<i>c</i> 1.54	1.32	1.54	1.74	1.88	1.89	2.16	2.52	2.42	2.21	1.89
85	1.98	1.80	1.72	1.67	2.00	2.28	2.52	2.64	2.57	2.40	2.25	1.92	2.15
86	1.72	1.59	1.53	1.62	1.87	2.01	2.08	1.99	1.97	2.07	1.92	1.78	1.85
87	1.47	1.49	1.80	1.97	1.76	1.92	2.20	2.28	2.14	2.07	1.83	1.61	1.88
88	1.50	1.51	1.44	1.44	1.91	2.69	2.88	3.02	2.97	2.88	2.74	2.39	2.28
89	2.07	1.85	1.68	1.69	2.04	2.16	2.35	2.54	2.67	2.51	2.20	1.90	2.14
1890	1.76	1.63	1.39	1.36	1.57	2.02	2.32	2.47	2.60	2.57	2.36	2.00	2.00
91	1.64	1.51	1.47	1.43	1.63	1.68	1.88 <i>d</i>	1.86 <i>d</i>	1.82 <i>d</i>	1.91 <i>d</i>	1.79 <i>d</i>	1.42	1.67
92	1.42	1.14	1.01	1.02	1.35	1.73	1.76	1.88	1.93	1.83	1.66	1.38	1.51
93	1.10	1.01	1.06	1.16	1.66	2.18	2.48	2.54	2.45	2.42	2.26	2.03	1.86
94	1.85	1.67	1.76	1.91	2.69	2.91	2.97	3.10	3.02	3.04	2.99	2.80	2.56
95	2.50	2.28	2.11	2.01	2.38	2.70	2.90	2.95	3.09	3.14	2.85	2.52	2.62
96	2.32	2.12	1.92	2.01	2.66	3.04	3.10	3.12	2.95	2.63	2.70	2.55	2.59
97	2.39	2.16	2.08	2.11	2.45	2.78	3.08	3.20	3.14	2.94	2.64	2.21	2.60
98	1.83	1.65	1.46	1.46	1.70	2.18	2.59	2.72	2.82	2.76	2.56	2.33	2.17
99	1.96	1.76	1.79	1.76	2.47	2.96	3.19	3.35	3.51	3.32	3.21	3.00	2.69
1900	2.63	2.45	2.23	2.13	2.30	2.36	2.58	2.94	3.46	3.54	3.51	3.13	2.77
01	2.78	2.48	2.28	2.22	2.51	2.61	3.09	3.22	3.04	3.07	3.00	2.68	2.75
02	2.32	2.11	1.97	2.02	2.34	2.64	2.88	2.89	2.93	2.81	<i>e</i> 2.81	<i>e</i> 2.58	2.52
<i>e</i> 03	2.24	1.98	1.88	2.07	2.56	2.94	3.14	3.25	3.27	3.40	3.18	2.80	2.73
<i>e</i> 04	2.50	2.33	2.23	2.17	2.47	2.77	2.86	2.95	3.08	3.26	3.19	2.74	2.71
<i>e</i> 05	2.47	2.13	2.04	2.25	2.49	2.67	2.97	3.10	3.32	3.33	3.17	2.96	2.74
<i>e</i> 06	2.72	2.43	2.22	2.15	2.48	2.78	2.90	2.93	2.95	2.84	2.66	2.45	2.63
<i>e</i> 07	2.22	2.06	1.94	1.94	2.10	2.55	2.70	2.93	3.17	3.15	2.88	2.53	2.51
Mean	602.03	601.85	601.77	601.86	602.16	602.42	602.63	602.73	602.79	602.74	602.56	602.26	602.32

Authority, U.S. Lake Survey, except for supplied values.
a.—Gage readings taken at Superior, Wis.
b.—Supplied by applying to the mean reading, for the following or preceding month, the mean rise or fall in stage between such months for the years 1861 or 1862 to 1871 inclusive.
c.—Supplied by adding to the Sault Ste. Marie readings the mean fall in the water surface between Marquette and Sault Ste. Marie for the years 1871 to 1888 inclusive.
d.—Supplied in like manner from years 1889 to 1901 inclusive.
e.—From self-registering gage.
NOTE.—Elevations depend on zero of gage 601.75 ft. and B. M. 3, 609.91 ft. U. S. Lake Survey, 1903 Levels.

TABLE 3.

WATER LEVELS OF ST. MARYS RIVER.

Monthly mean elevations of water surface of St. Marys River, at Southwest pier (above the locks) Sault Ste. Marie, Mich., in feet above mean tide at New York.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
a1860	602.22	601.95	601.93	602.18	602.55	602.74	602.74	602.80	602.72	602.76	602.58	602.18	602.45
a 61	1.93	1.66	1.52	1.91	2.68	2.85	3.05	3.02	2.87	2.90	2.55	2.12	2.42
a 62	1.72	1.51	1.54	1.58	2.40	2.41	2.42	2.60	2.66	2.59	2.25	1.93	2.13
a 63	1.69	1.54	1.37	1.39	1.66	1.60	1.78	2.41	2.37	2.20	1.84	1.68	1.79
a 64	1.34	1.11	1.18	1.18	1.48	1.65	1.78	1.80	1.89	1.63	1.43	1.23	1.48
a 65	1.00	0.97	0.84	1.26	1.89	2.32	2.68	2.77	2.72	2.51	1.97	1.61	1.88
a 66	1.27	1.04	1.04	1.47	1.86	2.07	2.40	2.64	2.31	2.33	1.99	2.05	1.87
a 67	1.73	1.60	1.41	1.61	1.75	2.37	2.74	2.63	2.65	2.63	2.19	1.82	2.09
a 68	1.61	1.00	1.36	1.53	2.07	2.00	2.26	2.19	2.26	2.23	2.38	1.90	1.90
a 69	1.63	1.37	0.92	1.48	2.02	2.05	2.46	2.93	3.72	3.20	2.85	2.15	2.23
1870	a 1.85	a 1.62	a 1.63	a 1.71	a 2.18	a 2.01	a 2.24	a 2.25	a 2.36	a 2.20	2.01	1.03	1.92
71	1.36	1.20	0.93	1.07	1.64	2.05	2.23	2.15	2.20	2.00	1.78	1.39	1.67
72	1.14	1.06	0.82	0.78	1.67	1.84	2.24	2.56	2.63	2.48	2.33	1.88	1.79
73	1.48	1.31	1.33	1.35	1.91	2.04	2.48	2.73	2.80	2.68	2.46	2.22	2.07
74	1.67	1.51	1.40	1.28	1.70	2.13	2.50	2.56	2.54	2.67	2.45	2.35	2.06
75	1.89	1.64	1.60	1.85	2.16	2.46	2.54	2.56	2.84	2.71	2.43	1.87	2.21
76	1.84	1.79	1.53	1.57	2.29	2.87	3.34	3.39	3.42	3.09	2.81	2.32	2.52
77	2.03	2.06	1.94	1.82	1.82	2.04	2.37	2.49	2.25	2.29	2.05	1.89	2.09
78	1.67	1.41	1.31	1.29	1.57	1.83	1.94	1.90	1.61	1.72	1.64	1.42	1.61
79	1.02	0.62	0.38	0.51	0.88	1.02	1.32	1.35	1.27	1.30	1.12	0.72	0.96
1880	0.52	0.49	0.40	0.41	1.15	1.91	2.15	2.03	2.19	1.96	1.99	1.71	1.41
81	1.40	1.30	1.32	1.21	1.63	1.86	2.06	1.98	2.17	2.63	2.53	2.20	1.86
82	1.69	1.47	1.35	1.30	1.71	1.80	2.15	2.25	2.19	2.10	2.04	1.77	1.82
83	1.34	1.25	1.25	1.32	1.31	1.68	1.86	2.28	1.95	1.80	1.69	1.43	1.60
84	1.33	1.14	1.05	0.88	1.25	1.35	1.57	1.61	1.68	1.77	1.87	1.61	1.43
85	1.44	1.33	1.19	1.02	1.60	1.94	2.12	2.34	2.10	1.92	1.85	1.55	1.70
86	1.20	1.04	1.04	1.02	1.50	1.66	1.83	1.97	1.83	1.86	1.79	1.36	1.51
87	1.14	1.00	0.97	0.83	1.19	1.64	2.01	1.89	1.75	1.93	1.70	1.29	1.44
88	1.13	0.79	0.84	0.83	1.43	2.28	2.44	2.43	2.35	2.34	2.14	1.80	1.73
89	1.52	1.23	1.26	1.25	1.81	1.99	2.26	2.27	2.26	2.11	1.81	1.43	1.77
1890	1.48	0.93	0.92	0.85	1.32	1.90	2.26	2.17	2.06	1.99	1.85	1.55	1.61
91	0.86	0.97	0.82	1.00	1.43	1.38	1.49	1.50	1.43	1.49	1.38	1.07	1.24
92	1.01	0.65	0.47	0.63	1.14	1.50	1.64	1.65	1.71	1.60	1.32	1.04	1.20
93	0.79	0.59	0.60	0.85	1.42	1.95	2.15	2.23	2.10	2.04	1.99	1.45	1.51
94	1.23	1.15	1.04	1.42	2.40	2.64	2.78	2.79	2.66	2.70	2.60	2.30	2.14
95	2.00	1.86	1.66	1.64	2.04	2.43	2.67	2.68	2.85	2.97	2.45	2.24	2.29
96	1.69	1.68	1.48	1.57	2.18	2.59	2.72	2.74	2.61	2.18	2.21	2.15	2.15
97	1.92	1.61	1.63	1.76	2.11	2.47	2.69	2.85	2.68	2.47	2.36	1.87	2.20
98	1.38	1.15	1.00	1.13	1.42	1.83	2.17	2.28	2.42	2.26	2.09	2.01	1.76
99	1.53	1.37	1.26	1.26	2.12	2.56	2.76	2.91	3.10	2.77	b 2.69	b 2.64	2.25
b 1900	2.03	1.90	1.64	1.68	1.87	1.94	2.17	2.39	2.90	2.93	3.04	2.63	2.26
b 01	2.17	1.87	1.65	1.76	2.06	2.15	2.56	2.74	2.60	2.72	2.66	2.27	2.27
b 02	1.90	1.61	1.53	1.69	1.88	2.25	2.48	2.49	2.54	2.39	2.46	2.29	2.13
b 03	1.83	1.60	1.51	1.76	2.15	2.57	2.70	2.80	2.82	2.98	2.85	2.41	2.33
b 04	1.87	1.64	1.40	1.76	2.09	2.34	2.48	2.55	2.65	2.82	2.71	2.30	2.22
b 05	2.00	1.59	1.36	1.78	2.07	2.25	2.60	2.73	2.92	2.96	2.73	2.52	2.29
b 06	2.18	1.85	1.63	1.70	2.02	2.30	2.50	2.46	2.46	2.36	2.19	1.95	2.13
b 07	1.62	1.43	1.34	1.59	1.71	2.12	2.33	2.50	2.70	2.71	2.56	2.08	2.06
Mean	601.55	601.34	601.24	601.35	601.80	602.08	602.31	602.40	602.41	602.35	602.18	601.86	601.91

Authority, U.S. Lake Survey, except for supplied values.

a.—Values supplied by subtracting from the Superior, Wis, readings the mean fall in water surface between Superior and Sault Ste. Marie for the years 1860 to November, 1870, inclusive.

b.—From self-registering gage.

NOTE.—Elevations depend on B.M. " A " 606,069 ft., U.S. Lake Survey, 1903 Levels.

SESSIONAL PAPER No. 54.

TABLE 4.
WATER LEVELS OF LAKE MICHIGAN.

Monthly mean elevations of water surface of Lake Michigan, at Milwaukee, Wis., in feet above mean tide at New York.

YEAR	JAN.	FEB.	MAR.	APR L	MAY	JUNE	JULY	AUG.	SE T.	OCT.	NOV.	DEC.	MEAN
1860	582.51	582.69	582.72	582.85	582.97	583.09	583.13	582.94	582.74	582.43	582.10	581.94	582.68
61	1.83	1.92	2.31	2.41	2.83	2.99	3.12	3.36	3.05	2.93	2.70	2.53	2.66
62	2.33	2.18	2.48	2.64	2.89	3.02	2.92	2.91	2.84	2.73	2.34	2.20	2.62
63	2.13	2.18	2.17	2.17	2.38	2.47	2.42	2.29	2.11	2.02	1.58	1.92	2.15
64	1.69	1.55	1.80	1.51	2.02	2.01	1.91	1.73	1.46	1.07	0.90	0.77	1.54
65	0.56	0.65	0.82	1.31	1.47	1.51	1.94	1.96	1.84	1.60	1.04	0.73	1.29
66	0.47	0.23	0.28	0.73	0.91	1.20	1.46	1.52	1.37	1.26	1.17	0.91	0.96
67	0.89	0.94	1.12	1.41	1.63	1.94	2.09	2.02	1.75	1.42	0.96	0.61	1.40
68	0.45	0.41	1.09	0.99	1.27	1.48	1.51	1.17	0.93	0.70	0.63	0.35	0.92
69	0.25	0.32	0.06	0.43	0.76	1.29	1.67	1.93	1.82	1.46	1.34	1.06	1.03
1870	1.12	1.21	1.51	1.93	2.27	2.41	2.52	2.43	2.57	2.17	1.77	1.42	1.94
71	1.57	1.49	2.09	2.29	2.64	2.68	2.71	2.48	1.81	1.12	1.07	0.48	1.87
72	0.35	0.35	0.13	0.38	0.63	1.00	1.03	1.01	0.94	0.82	0.53	579.87	0.59
73	579.87	579.91	0.22	0.79	1.35	1.98	1.94	2.04	1.85	1.79	1.56	581.52	1.24
74	581.48	581.77	1.92	1.82	1.80	2.17	2.10	2.11	1.86	1.51	1.31	0.97	1.74
75	0.77	0.70	0.76	1.12	1.68	1.92	1.89	2.06	1.99	1.84	1.63	1.44	1.48
76	1.39	1.59	1.92	2.12	2.74	3.15	3.49	3.42	3.37	2.79	2.89	2.42	2.61
77	2.28	2.29	2.29	2.67	2.56	2.63	2.60	2.48	2.27	2.28	2.16	2.10	2.38
78	1.98	1.91	2.07	2.09	2.39	2.53	2.54	2.22	2.02	1.91	1.78	1.46	2.08
79	1.15	1.16	1.20	1.19	1.32	1.39	1.48	1.29	1.17	0.95	0.73	0.76	1.15
1880	0.80	0.71	0.75	0.92	1.26	1.77	1.99	2.02	1.72	1.38	1.06	0.89	1.27
81	0.90	1.11	1.40	1.31	1.82	2.05	2.02	2.02	1.79	2.12	1.95	1.85	1.70
82	1.63	1.62	1.99	2.12	2.22	2.49	2.62	2.81	2.69	2.28	2.07	1.74	2.19
83	1.48	1.52	1.61	1.82	2.30	2.66	3.26	3.23	3.04	2.82	2.37	2.29	2.37
84	2.07	2.19	2.44	2.62	2.83	2.99	2.83	2.69	2.44	2.44	2.08	2.05	2.47
85	2.06	2.29	2.25	2.44	2.80	3.01	3.10	3.31	3.17	3.03	2.73	2.44	2.72
86	2.67	2.69	2.97	3.24	3.50	3.57	3.38	3.15	2.91	2.81	2.47	2.14	2.96
87	2.06	2.43	2.59	2.54	2.74	2.87	2.81	2.67	2.33	1.88	1.55	1.43	2.32
88	1.25	1.20	1.38	1.59	1.97	2.24	2.25	2.13	1.98	1.73	1.68	1.10	1.71
89	1.08	1.05	1.03	1.04	1.12	1.58	1.76	1.52	1.35	1.10	0.75	0.57	1.16
1890	0.65	0.61	0.59	0.91	1.14	1.55	1.62	1.54	1.34	1.23	0.89	0.54	1.05
91	0.52	0.28	0.47	0.78	0.88	1.03	0.86	0.79	0.56	0.20	579.80	579.74	0.49
92	579.86	0.05	579.95	0.01	0.43	0.88	0.89	0.97	0.77	0.53	580.26	9.99	0.38
93	9.98	0.12	580.23	0.69	0.99	1.32	1.34	1.17	0.85	0.71	0.32	580.25	0.66
94	580.26	0.29	0.55	0.70	1.24	1.40	1.43	1.35	0.92	0.71	0.44	0.09	0.78
95	579.91	579.80	579.77	579.97	0.13	0.18	0.07	579.95	579.68	579.31	579.09	578.98	579.74
96	9.06	9.10	9.11	9.29	579.57	579.89	579.83	9.76	9.66	9.61	9.39	9.34	9.47
97	9.33	9.41	9.72	9.89	580.38	580.65	580.84	508.78	580.53	580.24	9.98	9.76	580.13
98	9.72	9.86	580.18	580.50	0.78	0.91	0.89	0.69	0.34	0.33	9.92	9.58	0.31
99	9.53	9.61	579.81	0.08	0.52	0.83	1.04	0.96	0.82	0.49	580.31	9.81	0.32
1900	9.66	9.77	9.94	0.07	0.31	0.42	0.53	0.70	0.65	0.66	0.52	580.19	0.28
01	9.95	9.92	508.34	0.49	0.92	0.97	1.06	1.11	0.92	0.56	0.23	579.95	0.51
02	9.76	9.61	579.84	579.91	0.30	0.50	0.83	0.85	0.48	0.33	0.20	9.91	0.22
03	9.69	9.85	580.06	580.33	0.43	0.61	0.79	0.72	0.77 ^a	0.50 ^a	0.14 ^a	9.88	0.31
^a 04	9.90	9.86	0.14	0.60	0.95	1.35	1.36	1.26	1.19	1.06	0.75	580.44	0.74
^a 05	580.27	580.21	0.33	0.71	0.97	1.36	1.54	1.51	1.41	0.97	0.71	0.55	0.88
06	^a 0.53	^a 0.68	^a 0.83	^a 1.01	1.27	1.39	1.44	1.41	1.06	0.86	0.68	0.69	0.99
07	0.60	0.64	0.70	0.96	1.12	1.48	1.48	1.38	1.37	1.16	0.74	0.63	1.02
Mean	580.84	580.87	581.04	581.24	581.53	581.77	581.84	581.79	581.59	581.37	581.11	580.88	581.32

Authority, U.S. Lake Survey.

^a.—Self-registering gage on harbor pier.

NOTE.—Elevations depend on check point (1876) on Chestnut St. Bridge (destroyed) as 586.55 ft. and check point (1902) on same bridge as 584.47 ft., U.S. Lake Survey, 1903 Levels.

TABLE 5.

WATER LEVELS OF LAKE HURON.

Monthly mean elevations of water surface of Lake Huron, at Harbor Beach, Mich., in feet above mean tide at New York.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
1860	582.83	582.78	582.92	582.89	582.94	583.18	583.27	583.19	583.00	582.62	582.50	582.20	582.86
61	1.99	2.03	2.17	2.37	2.99	3.33	3.45	3.56	3.48	3.26	2.95	2.82	2.87
62	2.41	2.43	2.34	2.55	2.92	3.04	3.09	3.07	2.85	3.13	2.81	2.52	2.77
63	2.36	2.21	2.16	2.23	2.55	2.68	2.59	2.60	2.46	2.20	2.16	1.93	2.34
64	1.79	1.75	1.75	1.95	2.38	2.39	2.34	2.23	1.91	1.38	1.21	1.08	1.85
65	0.72	0.81	0.98	1.47	1.63	1.67	2.10	2.12	2.00	1.76	1.20	0.89	1.45
66	0.63	0.39	0.44	0.88	1.07	1.36	1.62	1.68	1.53	1.42	1.33	1.07	1.12
67	1.05	1.10	1.28	1.57	1.79	2.10	2.25	2.18	1.91	1.58	1.12	0.77	1.56
68	0.61	0.57	1.25	1.15	1.43	1.64	1.67	1.33	1.09	0.86	0.79	0.51	1.08
69	0.41	0.48	0.22	0.59	0.92	1.45	1.83	2.09	1.98	1.62	1.50	1.22	1.19
1870	1.28	1.37	1.67	2.09	2.43	2.57	2.68	2.59	2.73	2.33	1.93	1.58	2.10
71	1.73	1.65	2.25	2.45	2.80	2.84	2.87	2.56	2.24	1.74	1.53	1.16	2.15
72	0.99	0.79	0.29	0.71	1.11	1.51	1.61	1.58	1.48	1.36	1.06	0.77	1.10
73	0.60	0.57	0.64	1.05	1.55	1.95	2.15	2.16	1.99	1.96	1.86	1.70	1.52
74	1.72	1.86	2.00	1.85	1.90	2.24	2.40	2.29	2.11	1.84	1.30	1.45	1.91
75	1.16	1.10	1.14	1.33	1.68	1.99	2.18	2.15	2.19	2.00	1.89	1.62	1.70
76	1.74	1.72	1.85	2.13	2.73	3.22	3.66	3.60	3.49	3.09	2.94	2.75	2.74
77	2.46	2.45	2.38	2.46	2.63	2.59	2.77	2.67	2.40	2.26	2.21	2.16	2.45
78	2.06	1.89	2.06	1.99	2.39	2.56	2.60	2.50	2.21	2.22	2.03	1.83	2.20
79	1.53	1.29	1.25	1.28	1.41	1.55	1.59	1.46	1.38	1.14	1.02	1.00	1.32
1880	1.05	0.99	0.98	0.99	1.39	1.88	2.19	2.08	1.97	1.61	1.49	1.29	1.49
81	1.16	1.55	1.56	1.58	1.90	2.07	2.22	2.05	1.89	2.14	2.27	2.10	1.87
82	1.95	1.72	1.86	2.08	2.25	2.48	2.62	2.68	2.56	2.33	2.08	1.93	2.21
83	1.73	1.68	1.72	1.73	2.30	2.72	3.20	3.40	3.08	2.75	2.86	2.75	2.49
84	2.56	2.41	2.45	2.76	2.98	3.04	3.12	3.00	2.65	2.81	2.46	2.20	2.70
85	2.47	2.38	2.38	2.49	2.89	3.18	3.24	3.39	3.29	3.06	2.87	2.67	2.86
86	2.67	2.74	2.93	3.22	3.55	3.64	3.48	3.33	3.15	3.02	2.75	2.43	3.08
87	2.26	2.45	2.66	2.57	2.77	2.89	2.97	2.76	2.41	2.19	1.74	1.45	2.43
88	1.34	1.25	1.42	1.56	2.00	2.30	2.33	2.37	2.08	1.78	1.60	1.39	1.78
89	1.25	1.17	1.15	1.08	1.22	1.55	1.81	1.75	1.58	1.21	0.87	0.71	1.28
1890	0.78	0.66	0.64	0.78	1.09	1.52	1.71	1.71	1.44	1.23	1.03	0.73	1.11
91	0.53	0.42	0.39	0.72	0.96	0.91	0.94	0.84	0.65	0.28	579.97	579.91	0.54
92	579.93	579.87	579.93	0.05	0.14	0.67	0.96	1.04	0.87	0.66	580.33	580.09	0.38
93	9.84	9.79	9.87	0.25	0.88	1.21	1.35	1.21	0.91	0.73	0.47	0.28	0.57
94	580.23	580.24	580.39	0.62	1.02	1.32	1.47	1.20	1.01	0.77	0.58	0.28	0.76
95	579.96	579.84	579.85	579.95	0.12	0.19	0.16	0.07	579.94	579.65	579.26	579.02	579.83
96	9.09	9.21	9.11	9.14	579.54	579.91	579.97	0.01	9.83	9.63	9.49	9.38	9.53
97	9.45	9.36	9.47	9.84	580.41	580.65	580.83	0.84	580.58	580.23	580.07	9.81	580.13
98	9.66	9.72	9.95	580.44	0.56	0.72	0.82	0.71	0.52	0.21	0.13	9.94	0.28
99	9.68	9.54	9.69	579.86	0.40	0.79	1.08	0.99	0.79	0.38	0.24	580.05	0.29
1900	9.82	9.83	9.86	9.98	0.13	0.30	0.55	0.64	0.72	0.66	0.66	0.46	0.30
01	580.22	580.08	580.07	580.55	0.81	0.91	1.06	1.11	0.88	0.66	0.43	0.10	0.57
a 02	0.00	579.81	579.73	579.91	0.16	0.48	0.76	0.83	0.51	0.27	0.17	579.93	0.22
a 03	579.74	9.78	9.92	580.27	0.39	0.56	0.75	0.73	0.80	0.83	0.41	580.12	0.36
a 04	9.91	9.91	580.08	0.63	0.96	1.42	1.55	1.53	1.36	1.26	0.95	0.50	0.84
a 05	580.38	580.30	0.29	0.66	0.95	1.40	1.57	1.56	1.45	1.22	0.93	0.67	0.95
a 06	0.53	0.69	0.76	0.94	1.20	1.33	1.45	1.36	1.12	0.87	0.68	0.65	0.96
a 07	0.65	0.68	0.68	0.90	1.08	1.39	1.64	1.49	1.42	1.21	0.83	0.62	1.05
Mean	581.02	581.99	581.06	581.26	581.57	581.82	581.97	581.92	581.75	581.53	581.31	581.09	581.44

Authority, U.S. Lake Survey (see page 4105, appendix EEE. Annual Report of the Chief of Engineers for 1904)

a.—Self-registering gage.

NOTE.—Elevations depend on gage bolt "E" 583.21 ft., B.M. "Jeaks" 610.56 ft., U.S. Lake Survey, 1903 Levels.

SESSIONAL PAPER No. 54.

TABLE 6.
WATER LEVELS OF ST. CLAIR RIVER.

Monthly mean elevations of water surface of St. Clair River, at Grand Trunk Railway (G.T.R.), in feet above mean tide at New York.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
a1860	582.06	582.02	582.14	581.82	581.86	582.08	582.16	582.08	581.92	581.58	581.47	581.20	581.87
a 61	1.31	1.35	1.47	1.36	1.91	2.21	2.32	2.41	2.34	2.15	1.87	1.76	1.87
a 62	1.71	1.70	1.62	1.52	1.84	1.95	2.00	1.98	1.78	2.03	1.75	1.49	1.78
a 63	1.64	1.51	1.46	1.23	1.52	1.63	1.55	1.56	1.44	1.20	1.17	0.96	1.41
a 64	1.14	1.10	1.10	0.98	1.36	1.37	1.33	1.23	0.95	0.48	0.32	0.21	0.96
a 65	0.18	0.26	0.42	0.56	0.70	0.73	1.12	1.13	1.03	0.81	0.32	0.04	0.61
a 66	0.10	579.89	579.93	0.03	0.20	0.46	0.69	0.74	0.61	0.51	0.43	0.20	0.32
a 67	0.48	580.52	580.68	0.64	0.84	1.12	1.25	1.19	0.95	0.65	0.24	579.93	0.71
a 68	0.09	0.05	0.56	0.27	0.52	0.71	0.73	0.43	0.22	0.01	579.95	9.70	0.27
a 69	579.91	579.97	579.74	579.77	0.07	0.54	0.88	1.11	1.01	0.69	580.58	580.33	0.38
a1870	580.68	580.76	581.03	581.11	1.41	1.53	1.63	1.55	1.68	1.32	0.96	0.65	1.19
a 71	1.08	1.01	1.54	1.43	1.74	1.77	1.80	1.52	1.24	0.80	0.61	0.28	1.24
a 72	0.42	0.25	579.80	579.88	0.24	0.59	0.68	0.65	0.56	0.46	0.19	579.93	0.30
a 73	0.08	0.05	580.11	580.18	0.63	0.98	1.16	1.17	1.02	0.99	0.90	580.76	0.67
a 74	1.07	1.20	1.32	0.89	0.94	1.24	1.38	1.28	1.12	0.88	0.40	0.54	1.02
a 75	0.57	0.52	0.56	0.43	0.74	1.02	1.19	1.16	1.20	1.03	0.93	0.69	0.84
a 76	1.09	1.07	1.19	1.14	1.68	2.11	2.50	2.45	2.35	2.00	1.86	1.69	1.76
a 77	1.73	1.72	1.66	1.44	1.59	1.55	1.71	1.62	1.38	1.26	1.21	1.17	1.50
a 78	1.38	1.22	1.38	1.02	1.37	1.52	1.56	1.47	1.21	1.22	1.05	0.88	1.27
a 79	0.90	0.69	0.66	0.39	0.50	0.63	0.66	0.55	0.48	0.26	0.16	0.14	0.50
a1880	0.48	0.42	0.42	0.13	0.48	0.92	1.20	1.10	1.00	0.68	0.57	0.40	0.65
a 81	0.58	0.92	0.93	0.65	0.94	1.09	1.22	1.07	0.93	1.15	1.27	1.12	0.99
a 82	1.28	1.07	1.20	1.10	1.25	1.45	1.58	1.63	1.52	1.32	1.10	0.96	1.29
a 83	1.08	1.04	1.07	0.79	1.29	1.67	2.09	2.27	1.99	1.69	1.79	1.69	1.54
a 84	1.82	1.69	1.72	1.70	1.90	1.95	2.02	1.92	1.60	1.75	1.44	1.20	1.73
a 85	1.74	1.66	1.66	1.46	1.82	2.08	2.13	2.26	2.17	1.97	1.80	1.62	1.86
a 86	1.92	1.98	2.15	2.11	2.41	2.49	2.34	2.24	2.05	1.93	1.69	1.41	2.06
a 87	1.55	1.72	1.91	1.53	1.71	1.82	1.89	1.70	1.39	1.20	0.80	0.54	1.48
a 88	0.74	0.66	0.81	0.64	1.03	1.29	1.32	1.36	1.09	0.83	0.67	0.48	0.91
a 89	0.66	0.58	0.57	0.21	0.33	0.63	0.86	0.80	0.55	0.32	0.02	579.88	0.45
a1890	0.24	0.13	0.11	579.94	0.22	0.60	0.77	0.77	0.53	0.34	0.16	9.90	0.31
a 91	0.01	579.92	579.89	9.89	0.10	0.06	0.08	0.00	579.83	579.50	579.22	9.17	579.81
a 92	579.48	9.43	9.48	9.26	579.37	579.84	0.10	0.17	580.02	9.84	9.54	9.33	9.66
a 93	9.40	9.36	9.43	9.47	580.03	580.70	0.45	0.32	0.07	9.88	9.68	9.50	9.86
a 94	9.75	9.76	9.89	9.80	0.16	0.42	0.56	0.32	0.15	9.93	9.76	9.50	580.00
a 95	9.57	9.46	9.47	9.27	579.40	579.48	579.45	579.37	579.26	9.00	8.65	8.44	579.24
a 96	8.89	8.90	8.81	8.55	8.90	9.23	9.28	9.32	9.16	8.98	8.86	8.75	8.96
a 97	9.12	9.04	9.16	9.17	9.68	9.89	580.05	580.06	9.83	9.52	9.41	9.14	9.51
a 98	9.30	9.36	9.56	9.70	9.81	9.95	0.04	579.94	9.77	9.50	9.43	9.26	9.64
a 99	a 9.32	a 9.20	b 9.33	b 9.21	b 9.58	b 580.02	b 0.30	b 580.24	b 580.05	b 9.60	b 9.47	b 9.28	9.63
b1900	9.39	9.47	9.47	9.22	9.43	579.58	579.80	579.87	579.85	9.77	9.75	9.52	9.59
b 01	9.57	9.76	9.56	580.02	9.99	9.98	580.17	580.26	580.02	9.79	9.58	9.32	9.84
b 02	9.53	9.34	8.95	579.11	9.32	9.63	579.95	0.01	579.73	9.55	9.35	9.18	9.47
b 03	9.37	9.44	9.28	9.52	9.56	9.77	9.90	579.93	9.96	9.94	9.54	9.41	9.64
b 04	9.46	9.50	9.54	9.90	580.12	580.53	580.56	580.55	580.46	580.32	580.07	9.77	580.06
b 05	580.18	580.07	9.79	9.83	0.07	0.50	0.70	0.70	0.57	0.31	0.04	580.78	0.30
b 06	579.75	0.30	580.23	580.11	0.30	0.38	0.57	0.49	0.27	0.04	579.88	0.07	0.20
b 07	580.13	0.39	0.12	0.08	0.22	0.49	0.66	0.63	0.53	0.33	9.90	579.74	0.27
Mean	580.46	580.45	580.48	580.38	580.65	580.88	581.00	580.97	580.81	580.61	580.41	580.25	580.61

Authority, U.S. Lake Survey, except for supplied values.
a.—Supplied for Harbor Beach readings for the summer months, April to December, inclusive, by formula (G.T.R.—578) = 0.889 (Harbor Beach—578) — 0.529 : and for winter months, January to March, inclusive, by formula (G.T.R.—578) = 0.889 (Harbor Beach—578) — 0.235.
b.—Self-registering gage.
NOTE.—Elevations depend on B.M. Fort Gratiot Light-house (1877) as 590.342 ft., U.S. Lake Survey, 1903 Levels.

TABLE 7.

WATER LEVELS OF LAKE ST. CLAIR.

Monthly mean elevations of water surface of Lake St. Clair, at the St. Clair Flats Canal, in feet above mean tide at New York.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
a1860	576.31	574.84	575.94	576.50	576.89	577.03	576.40	576.30	575.90	576.59	75.68	576.29	576.22
b 61	6.37	4.93	6.02	6.77	6.83	7.03	7.00	7.17	6.98	6.78	6.64	6.64	6.60
b 62	6.29	5.14	6.07	7.24	7.24	7.28	7.27	7.15	6.94	6.74	6.43	6.30	6.67
b 63	6.48	6.41	6.15	6.63	6.90	6.77	6.83	6.79	6.61	6.11	5.94	5.90	6.46
b 64	6.14	5.50	5.61	6.30	6.70	6.90	6.67	6.47	6.29	5.80	5.72	5.83	6.16
65	b 4.53	b 3.78	b 4.48	b 5.64	b 6.17	b 6.21	b 6.40	c 6.38	c 6.32	c 6.11	c 5.66	c 5.52	5.60
66	b 5.42	c 4.91	c 4.96	c 5.72	c 5.84	c 6.13	c 6.39	c 6.24	c 6.18	c 6.18	c 6.03	c 6.20	5.85
c 67	5.30	5.28	4.82	6.06	6.46	6.84	6.70	6.61	6.25	5.90	5.42	5.30	5.91
68	d 5.27	d 4.15	d 5.43	c 5.64	c 6.10	c 6.41	c 6.34	c 6.00	c 5.78	c 5.40	c 5.15	c 5.12	5.57
69	d 4.81	d 4.39	d 4.58	c 5.35	c 5.45	c 6.00	c 6.48	c 6.48	c 6.28	c 5.87	c 5.60	d 5.95	5.60
1870	d 6.79	d 5.52	d 5.52	c 6.38	c 6.74	c 6.80	c 7.04	c 6.98	c 6.74	c 6.34	c 6.11	c 6.10	6.42
71	d 5.71	d 4.71	c 6.40	c 6.48	c 6.72	c 6.78	c 6.82	c 6.63	c 6.36	c 5.78	c 5.60	d 5.83	6.15
72	d 5.09	d 4.98	d 4.70	c 5.12	c 5.32	c 5.74	5.47	5.61	5.47	5.45	4.96	4.92	5.24
73	4.42	4.65	4.99	5.87	5.89	6.16	6.30	6.29	6.06	5.81	5.62	5.83	5.66
74	5.05	4.41	5.84	6.06	6.02	6.23	6.40	6.31	6.10	5.86	5.57	5.26	5.76
75	5.11	5.04	5.20	5.21	5.78	5.95	6.18	6.11	5.96	5.79	5.61	5.51	5.62
76	5.66	6.11	6.89	6.86	6.63	7.52	7.68	7.51	7.04	6.71	6.60	7.45	6.89
77	6.98	5.52	4.24	5.20	5.45	6.28	6.53	6.44	6.19	c 6.12	6.24	6.03	5.94
78	5.92	5.00	5.16	b 6.47	b 6.63	6.68	6.80	6.71	6.37	6.18	5.85	5.61	6.12
79	5.20	4.51	5.20	5.75	5.63	b 5.90	b 6.01	b 5.80	b 5.61	b 5.32	b 5.02	b 5.25	5.43
b1880	5.52	5.07	5.50	5.66	5.84	6.23	6.19	6.27	6.02	5.68	5.51	6.18	5.81
81	b 4.60	b 5.05	b 5.06	b 5.67	b 6.01	b 6.31	b 6.32	b 6.20	6.07	5.87	e 6.00	c 6.13	5.77
82	e 6.40	e 6.02	e 6.53	e 6.57	6.99	e 6.81	7.41	7.40	e 6.76	e 6.45	6.17	c 6.67	6.68
83	e 6.28	e 6.00	e 5.39	e 5.95	6.34	7.07	7.74	7.66	7.20	6.83	6.39	6.36	6.60
84	4.93	5.38	6.75	6.99	7.16	7.33	7.38	7.09	6.73	6.51	6.14	6.32	6.56
85	6.82	6.02	6.86	6.88	6.73	7.10	7.01	7.12	6.97	6.65	6.61	6.59	6.78
86	5.75	4.86	5.64	6.30	6.99	7.04	7.05	6.93	6.78	6.62	6.28	6.55	6.40
87	6.24	6.35	6.35	6.55	6.77	6.86	6.86	6.68	6.40	6.07	5.65	5.61	6.37
88	5.67	5.45	5.16	5.81	5.83	6.04	6.33	6.23	5.99	5.71	5.58	5.47	5.77
89	5.71	4.77	4.68	4.98	5.36	5.91	6.05	5.90	5.70	5.31	5.03	4.96	5.36
1890	5.44	5.29	5.26	5.65	5.91	6.34	6.27	6.03	5.79	5.57	5.54	5.39	5.71
91	4.97	5.07	4.86	5.23	5.18	5.29	5.36	5.25	5.12	4.80	4.56	4.64	5.03
92	4.26	3.51	3.70	4.53	5.07	5.69	5.89	5.71	5.60	5.15	4.76	4.54	4.87
93	3.70	3.80	4.64	5.07	5.48	5.82	5.86	5.68	5.42	5.16	4.88	4.98	5.04
94	4.99	4.49	4.86	5.01	5.46	5.69	5.73	5.53	5.38	5.12	4.88	4.82	5.16
95	5.28	5.29	4.69	4.19	4.49	4.63	4.69	4.65	4.53	4.13	3.84	4.12	4.54
96	4.17	3.33	3.57	4.09	4.34	4.70	4.87	5.03	4.71	4.61	4.15	4.13	4.31
97	4.42	4.77	4.72	4.77	5.18	5.28	5.43	5.40	5.14	4.78	4.61	4.64	4.93
98	4.58	4.10	4.73	5.17	5.29	5.49	5.54	5.40	5.13	4.87	4.82	4.90	5.00
99	4.80	4.57	4.53	4.65	5.07	5.34	5.51	5.45	5.14	4.84	4.71	4.65	4.94
1900	4.18	4.29	4.77	4.87	4.98	5.15	5.23	5.28	5.16	5.01	4.88	4.74	4.88
01	4.59	3.68	3.96	3.17	4.27	5.03	5.24	5.24	5.22	4.90	4.61	4.64	4.55
02	f 3.70	f 3.29	f 4.26	4.46	4.70	5.07	5.70	5.56	5.28	5.18	4.89	4.99	4.76
03	5.19	f 4.73	f 5.05	f 5.57	5.36	5.49	5.62	5.54	5.53	5.39	4.89	5.29	5.30
04	4.12	4.44	5.58	5.85	5.80	6.13	6.19	6.08	5.92	5.68	5.28	5.39	5.54
05	4.46	4.14	4.75	5.05	5.39	5.82	6.01	5.95	5.78	5.54	5.26	5.11	5.27
06	f 5.25	f 4.32	f 4.30	f 5.14	f 5.40	f 5.61	f 5.81	f 5.76	f 5.55	5.37	5.44	5.32	f 5.27
07	5.49	4.99	5.02	5.64	5.78	6.11	6.27	f 5.98	f 5.76	f 5.69	f 5.35	f 5.32	5.62
Mean	575.30	574.85	575.20	575.64	575.89	576.17	576.28	576.19	575.96	575.72	575.48	575.53	575.68

Authority, U.S. Lake Survey, except for supplied values.
a.—Deduced by subtracting 0.67 foot from St. Clair Flats values (U.S.L.S. Report, 1904) to obtain original values at Old Detroit Waterworks, then supplying by formula (Fall St. Clair Flats to Amherstburg) = 0.9378 (Fall Old Detroit Waterworks to Amherstburg) + 0.853.
b.—Supplied by formula (Fall St. Clair Flats to Amherstburg) = 1.0357 (Fall Light-house Depot to Amherstburg) + 0.377.
c.—Supplied by using mean of two values derived from equations (Fall St. Clair Flats to Amherstburg) = 0.9378 (Fall Old Detroit Waterworks to Amherstburg) + 0.853; and (Fall St. Clair Flats to Amherstburg) = 1.0357 (Fall Light-house Depot to Amherstburg) + 0.377.
d.—Supplied by formula (Fall St. Clair Flats to Amherstburg) = 0.9378 (Fall Old Detroit Waterworks to Amherstburg) + 0.853.
e.—Derived by first subtracting 0.477 foot from New Detroit Waterworks' readings and then applying the mean monthly fall from St. Clair Flats to New Detroit Waterworks, as deduced from observations taken at those points from January, 1899 to June, 1901, inclusive.
f.—Derived from observations taken at Windmill Point by applying the mean monthly fall from St. Clair Flats Canal to Windmill Point as determined from simultaneous observations taken at those points from January, 1897, to July, 1907, inclusive.
NOTE.—Elevations depend on zero of gage 575.36 ft., and P.B.M., " Upper Light," 581.76 ft., U.S. Lake Survey, 1903 Levels.

SESSIONAL PAPER No. 54.

TABLE 8.
WATER LEVELS OF LAKE ST. CLAIR.

Monthly mean elevations of water surface of Lake St. Clair, at Windmill Point, near the outlet of Lake St. Clair, in feet above mean tide at New York.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
a1860	575.92	574.51	575.64	576.24	576.69	576.84	576.17	576.08	575.65	576.30	575.38	575.93	575.95
a 61	5.98	4.60	5.72	6.51	6.63	6.84	6.77	6.95	6.73	6.49	6.34	6.28	6.32
a 62	5.90	4.81	5.77	6.98	7.04	7.09	7.04	6.93	6.69	6.45	6.13	5.94	6.40
a 63	6.09	6.08	5.85	6.37	6.70	6.58	6.60	6.57	6.36	5.82	5.64	5.54	6.18
a 64	5.75	5.17	5.31	6.04	6.50	6.71	6.44	6.25	6.04	5.51	5.42	5.47	5.88
a 65	4.14	3.45	4.18	5.38	5.97	6.02	6.17	6.16	6.07	5.82	5.36	5.16	5.32
a 66	5.03	4.58	4.66	5.46	5.64	5.94	6.16	6.02	5.93	5.89	5.73	5.84	5.57
a 67	4.91	4.95	4.52	5.80	6.26	6.65	6.47	6.39	6.00	5.61	5.12	4.94	5.64
a 68	4.88	3.82	5.13	5.38	5.90	6.22	6.11	5.78	5.53	5.11	4.85	4.76	5.29
a 69	4.42	4.06	4.28	5.09	5.25	5.81	6.25	6.26	6.03	5.58	5.30	5.59	5.33
a1870	6.40	5.19	5.22	6.12	6.54	6.61	6.81	6.76	6.49	6.05	5.81	5.74	6.14
a 71	5.32	4.38	6.10	6.22	6.52	6.59	6.59	6.41	6.11	5.49	5.30	5.47	5.88
a 72	4.70	4.65	4.40	4.84	5.12	5.55	5.24	5.39	5.22	5.16	4.66	4.56	4.96
a 73	4.03	4.32	4.69	5.61	5.69	5.97	6.07	6.07	5.81	5.52	5.32	5.47	5.38
a 74	4.66	4.08	5.54	5.80	5.82	6.04	6.17	6.09	5.85	5.57	5.27	4.96	5.48
a 75	4.72	4.71	4.90	4.95	5.58	5.76	5.95	5.89	5.71	5.50	5.31	5.15	5.34
a 76	5.27	5.78	6.59	6.60	6.43	7.33	7.45	7.29	6.79	6.32	6.30	7.09	6.61
a 77	6.59	5.19	3.94	4.94	5.25	6.09	6.30	6.22	5.94	5.83	5.94	5.67	5.66
a 78	5.53	4.67	4.86	6.21	6.43	6.49	6.57	6.49	6.12	5.89	5.55	5.25	5.84
a 79	4.81	4.18	4.90	5.49	5.43	5.71	5.78	5.58	5.36	5.03	4.72	4.89	5.16
a1880	5.13	4.74	5.20	5.40	5.64	6.04	5.96	6.05	5.77	5.39	5.21	5.82	5.53
a 81	4.21	4.72	4.76	5.41	5.81	6.12	6.09	5.98	5.82	5.58	5.70	5.77	5.50
a 82	6.01	6.69	6.23	6.31	6.79	6.62	7.18	7.18	6.51	6.16	5.87	6.31	6.40
a 83	5.89	5.67	5.09	5.69	6.14	6.88	7.51	7.44	6.95	6.54	6.09	6.00	6.32
a 84	4.54	5.05	6.45	6.73	6.96	7.14	7.15	6.87	6.48	6.22	5.84	5.96	6.28
a 85	6.43	5.69	6.56	6.62	6.53	6.91	6.78	6.90	6.72	6.36	6.31	6.23	6.50
a 86	5.36	4.53	5.34	6.04	6.79	6.85	6.82	6.71	6.53	6.33	5.98	6.19	6.12
a 87	5.85	6.02	6.05	6.29	6.57	6.67	6.63	6.46	6.15	5.78	5.35	5.25	6.09
a 88	5.28	5.12	4.86	5.55	5.63	5.85	6.10	6.01	5.74	5.42	5.28	5.11	5.50
a 89	5.32	4.44	4.38	4.72	5.16	5.72	5.82	5.68	5.45	5.02	4.73	4.60	5.09
a1890	5.05	4.96	4.96	5.39	5.71	6.15	6.04	5.81	5.54	5.28	5.24	5.03	5.43
a 91	4.58	4.74	4.56	4.97	4.98	5.10	5.13	5.03	4.87	4.51	4.26	4.28	4.75
a 92	3.87	3.18	3.40	4.27	4.87	5.50	5.66	5.49	5.35	4.86	4.46	4.18	4.59
a 93	3.31	3.47	4.34	4.81	5.28	5.63	5.63	5.46	5.17	4.87	4.58	4.62	4.76
a 94	4.60	4.16	4.56	4.75	5.26	5.50	5.50	5.31	5.13	4.83	4.58	4.46	4.89
a 95	4.89	4.96	4.39	3.93	4.29	4.44	4.46	4.43	4.28	3.84	3.54	3.76	4.27
a 96	3.78	3.00	3.27	3.83	4.14	4.51	4.64	4.81	4.46	4.32	3.85	3.77	4.03
97	4.28	4.64	4.57	4.75	5.20	5.11	5.22	5.15	4.93	4.58	4.47	4.29	4.77
98	4.20	a 3.77	4.76	5.01	5.11	5.26	5.30	5.10	4.90	4.64	4.65	4.68	4.78
99	4.65	4.57	3.59	4.32	4.88	5.18	5.30	5.22	4.93	4.65	4.49	4.10	4.66
1900	4.03	4.24	4.67	4.64	4.79	4.99	5.01	5.06	4.89	4.74	4.52	4.41	4.67
01	4.01	3.06	3.32	2.69	3.94	4.81	5.04	5.07	4.89	4.56	4.30	4.47	4.18
02	3.31	2.96	3.96	4.22	a 4.50	a 4.88	5.50	5.41	5.08	4.92	4.62	4.64	4.50
03	4.69	4.40	4.75	5.31	5.27	5.38	5.44	5.36	5.29	5.04	4.54	4.94	5.03
04	3.74	3.92	4.92	5.64	5.61	5.92	5.97	5.82	5.60	5.31	4.94	4.89	5.19
05	3.78	3.50	3.87	4.73	5.11	5.66	5.80	5.74	5.52	5.18	4.84	4.73	4.87
06	4.86	3.99	4.00	4.88	5.20	5.42	5.58	5.54	5.30	5.08	4.99	4.89	4.98
07	4.94	4.65	4.60	5.24	5.44	5.78	5.90	5.76	5.51	5.40	5.05	4.96	5.27
Mean	574.91	574.52	574.87	575.38	575.69	575.98	576.05	575.97	575.71	575.43	575.16	575.17	575.40

Authority, U.S. Lake Survey, except for supplied values.
a.—Supplied by applying to the St. Clair Flats readings, the mean monthly fall from St. Clair Flats to Windmill Point, as deduced from observations taken between the years 1897 and 1907, inclusive.
NOTE.—Elevations depend on P.B.M., 12, 584.22 ft., U.S. Lake Survey, 1903 Levels.

TABLE 9.

WATER LEVELS OF DETROIT RIVER.

Monthly mean elevations of water surface of Detroit River, at Amherstburg, Ont., in feet above mean tide at New York.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
a1860	573.48	573.12	573.54	574.19	574.49	574.45	574.20	574.08	573.68	573.37	573.13	573.11	573.74
a 61	2.83	2.55	3.01	4.00	4.52	4.58	4.34	4.42	4.18	3.94	3.79	3.68	3.82
a 62	3.65	3.36	3.52	4.37	4.70	4.69	4.67	4.33	3.96	3.57	3.10	3.25	3.93
a 63	3.68	3.97	3.93	4.00	4.27	4.12	4.01	3.97	3.52	3.07	2.53	2.62	3.64
a 64	2.31	2.46	2.69	3.14	3.93	3.87	3.62	3.39	3.11	2.79	2.49	2.68	3.04
a 65	2.23	1.65	1.99	2.66	3.33	3.30	3.27	3.23	3.13	2.82	2.31	2.29	2.68
a 66	2.00	1.84	2.25	2.78	3.09	3.34	3.46	3.25	3.13	3.11	2.74	2.87	2.82
a 67	2.56	2.24	2.66	2.93	3.54	3.84	3.66	3.39	2.94	2.59	1.96	1.86	2.85
a 68	1.64	1.26	1.87	2.65	3.19	3.57	3.55	3.07	2.74	2.28	1.99	1.90	2.48
a 69	1.87	1.80	2.30	2.55	3.19	3.57	3.86	3.80	3.47	3.01	2.42	2.89	2.89
a1870	3.11	3.34	3.13	3.73	4.03	3.99	4.04	4.03	3.72	3.33	2.90	2.90	3.52
a 71	2.67	2.34	2.81	3.24	3.60	3.62	3.61	3.44	3.21	2.53	2.22	1.90	2.93
a 72	1.80	1.56	1.49	1.64	2.17	2.53	2.53	2.54	2.25	2.07	1.61	1.50	1.97
a 73	1.38	1.39	1.48	2.71	3.47	3.54	3.53	3.51	3.05	2.74	2.41	2.90	2.68
a 74	3.27	3.32	3.37	3.49	3.67	3.73	3.77	3.65	3.13	2.68	2.13	2.04	3.19
a 75	1.79	1.62	1.78	2.13	2.69	3.11	3.25	3.28	3.08	2.58	2.30	2.64	2.52
a 76	2.58	3.14	3.81	4.28	4.69	4.79	4.69	4.43	4.20	3.66	3.61	3.39	3.94
a 77	2.97	2.81	2.60	2.98	3.32	3.39	3.64	3.54	3.40	2.99	2.78	2.98	3.12
a 78	3.04	3.18	3.33	3.70	4.03	4.02	4.03	3.85	3.66	3.30	2.97	3.17	3.52
a 79	2.73	2.59	2.64	2.95	3.19	3.27	3.31	3.13	2.74	2.50	1.90	2.28	2.77
a1880	2.76	2.80	2.96	3.07	3.43	3.53	3.63	3.43	3.14	2.69	2.48	2.26	3.02
a 81	1.83	1.94	2.28	2.93	3.42	3.65	3.61	3.33	2.92	2.86	2.55	2.88	2.85
a 82	3.33	3.33	3.80	3.97	4.26	4.40	4.34	4.24	3.91	3.45	3.00	2.61	3.72
a 83	2.50	2.71	2.92	2.99	3.54	4.23	4.44	4.42	4.05	3.72	3.21	3.36	3.51
a 84	3.01	3.27	3.48	3.98	4.34	4.41	4.20	4.08	3.59	3.25	2.64	2.69	3.58
a 85	2.49	2.28	2.16	2.93	3.75	4.25	4.22	4.27	4.03	3.95	3.70	3.77	3.49
a 86	3.77	3.04	2.87	3.70	4.09	4.18	4.17	4.01	3.70	3.46	3.04	3.07	3.59
a 87	2.83	3.26	4.06	4.06	4.33	4.34	4.12	3.84	3.55	2.95	2.55	2.69	3.55
a 88	2.49	2.22	2.34	2.92	3.26	3.38	3.54	3.48	2.98	2.60	2.53	2.53	2.86
a 89	2.53	2.37	2.23	2.53	2.80	3.22	3.43	3.16	2.71	2.28	1.88	2.26	2.62
a1890	2.60	2.89	3.03	3.47	3.90	4.26	3.89	3.47	3.24	3.04	2.88	2.77	3.29
a 91	2.53	2.51	2.99	2.81	2.72	2.85	2.76	2.53	2.29	1.90	1.33	1.52	2.40
a 92	1.53	1.32	1.38	1.89	2.78	3.53	3.66	3.35	2.97	2.40	1.94	1.79	2.38
a 93	1.39	1.47	1.71	2.39	3.32	3.50	3.23	2.93	2.49	2.13	1.60	1.80	2.33
a 94	2.06	1.94	1.99	2.34	2.82	3.02	3.01	2.68	2.45	2.12	1.75	1.80	2.33
a 95	1.45	1.22	1.25	1.45	1.76	1.84	1.74	1.70	1.54	1.05	0.82	1.10	1.41
a 96	1.18	1.10	1.07	1.47	1.94	2.20	2.09	2.34	1.96	1.71	1.21	1.36	1.64
a 97	1.31	1.51	1.90	2.40	2.82	2.91	2.91	2.79	2.45	1.95	1.69	1.78	2.20
a 98	1.81	2.01	2.29	2.82	3.06	3.08	2.87	2.71	2.27	2.06	1.81	1.76	2.38
a 99	a 1.89	a 1.68	a 2.07	a 2.32	a 2.72	a 2.83	b 2.76	b 2.59	b 2.14	b 1.98	b 1.85	b 1.40	2.19
b1900	1.60	1.80	2.19	2.44	2.63	2.73	2.56	2.56	2.20	2.03	1.55	1.60	2.16
b 01	1.63	1.19	1.12	1.39	1.56	2.03	2.20	2.14	2.03	1.59	1.19	1.62	1.64
b 02	1.20	0.86	1.13	1.63	2.09	2.33	2.99	3.00	2.64	2.50	2.20	1.98	2.05
b 03	1.81	1.81	2.44	3.20	3.34	3.22	3.18	2.99	2.82	2.39	1.84	1.67	2.56
b 04	1.56	1.61	2.20	3.28	3.60	3.74	3.68	3.38	3.08	2.73	2.24	2.05	2.76
b 05	1.73	1.45	1.55	2.03	2.76	3.22	3.30	3.18	2.90	2.45	2.02	2.05	2.39
b 06	2.10	2.14	2.00	2.43	2.68	2.92	3.02	2.97	2.70	2.38	2.32	2.48	2.51
07	b 2.91	b 2.66	b 2.47	b 2.94	b 3.17	b 3.63	a 3.59	a 3.35	a 3.03	a 2.94	a 2.53	a 2.41	2.97
Mean	572.32	572.25	572.46	572.91	573.33	573.52	573.50	573.36	573.04	572.70	572.33	572.37	572.84

Authority, U.S. Lake Survey, except for supplied values.

a.—Supplied by applying to the Cleveland, O., readings, the mean monthly fall between Cleveland and Amherstburg, as deduced from observations taken during the period from July, 1899, to December, 1904, inclusive.

b.—Self-registering gage.

NOTE.—Elevations depend on Gage B.M., 579.337 ft., U.S. Lake Survey, 1903 Levels.

SESSIONAL PAPER No. 54.

TABLE 10.
WATER LEVELS OF LAKE ERIE.

Monthly mean elevations of water surface of Lake Erie, at Cleveland, O., in feet above mean tide at New York.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
1860	573.26	572.90	573.30	574.00	574.21	574.18	573.92	573.76	573.42	573.12	573.03	572.87	573.50
61	2.61	2.33	2.77	3.81	4.24	4.31	4.06	4.10	3.92	3.69	3.67	3.44	3.58
62	3.43	3.14	3.28	4.18	4.42	4.42	4.39	4.01	3.70	3.32	2.98	3.01	3.69
63	3.46	3.75	3.69	3.81	3.99	3.85	3.73	3.65	3.26	2.82	2.41	2.38	3.40
64	2.09	2.24	2.45	2.95	3.65	3.60	3.34	3.07	2.85	2.54	2.37	2.44	2.80
65	2.01	1.43	1.75	2.47	3.05	3.03	2.99	2.91	2.87	2.57	2.19	2.05	2.44
66	1.78	1.62	2.01	2.59	2.81	3.07	3.18	2.93	2.87	2.86	2.62	2.63	2.58
67	2.34	2.02	2.42	2.74	3.26	3.57	3.38	3.07	2.68	2.34	1.84	1.62	2.61
68	1.42	1.04	1.63	2.46	2.91	3.30	3.27	2.75	2.48	2.03	1.87	1.66	2.24
69	1.65	1.58	2.06	2.36	2.91	3.30	3.58	3.48	3.21	2.76	2.30	2.65	2.65
1870	2.89	3.12	2.89	3.54	3.75	3.72	3.76	3.71	3.46	3.08	2.78	2.66	3.28
71	2.45	2.12	2.57	3.05	3.32	3.35	3.33	3.12	2.95	2.28	2.10	1.66	2.69
72	1.58	1.34	1.25	1.45	1.89	2.26	2.25	2.22	1.99	1.82	1.49	1.26	1.73
73	1.16	1.17	1.24	2.52	3.19	3.27	3.25	3.19	2.79	2.49	2.29	2.66	2.44
74	3.05	3.10	3.13	3.30	3.39	3.46	3.49	3.33	2.87	2.43	2.01	1.80	2.95
75	1.57	1.40	1.54	1.94	2.41	2.84	2.97	2.96	2.82	2.33	2.18	2.40	2.28
76	2.36	2.92	3.57	4.09	4.41	4.52	4.41	4.11	3.94	3.41	3.49	3.15	3.70
77	2.75	2.59	2.36	2.79	3.04	3.12	3.36	3.22	3.14	2.74	2.66	2.74	2.88
78	2.82	2.96	3.09	3.51	3.75	3.75	3.75	3.53	3.40	3.05	2.85	2.93	3.28
79	2.51	2.37	2.40	2.76	2.91	3.00	3.03	2.81	2.48	2.25	1.78	2.04	2.53
1880	2.54	2.58	2.72	2.88	3.15	3.26	3.35	3.11	2.88	2.44	2.36	2.02	2.77
81	1.61	1.72	2.04	2.74	3.14	3.38	3.33	3.01	2.66	2.61	2.43	2.64	2.61
82	3.11	3.11	3.56	3.78	3.98	4.13	4.06	3.92	3.65	3.20	2.88	2.37	3.48
83	2.28	2.49	2.68	2.80	3.26	3.96	4.16	4.10	3.79	3.47	3.09	3.12	3.27
84	2.79	3.05	3.24	3.79	4.06	4.14	3.92	3.76	3.33	3.00	2.52	2.45	3.34
85	2.27	2.06	1.92	2.74	3.47	3.98	3.94	3.95	3.80	3.70	3.58	3.53	3.24
86	3.55	2.82	2.63	3.51	3.81	3.91	3.89	3.69	3.44	3.21	2.92	2.83	3.35
87	2.61	3.04	3.82	3.87	4.05	4.07	3.84	3.52	3.29	2.70	2.43	2.45	3.31
88	2.27	2.06	2.10	2.73	2.98	3.11	3.26	3.16	2.72	2.35	2.41	2.29	2.62
89	2.31	2.15	1.99	2.34	2.52	2.95	3.15	2.81	2.45	2.03	1.76	2.02	2.38
1890	2.38	2.67	2.79	3.28	3.62	3.99	3.61	3.15	2.98	2.79	2.76	2.53	3.05
91	2.31	2.29	2.75	2.62	2.44	2.58	2.48	2.21	2.03	1.65	1.21	1.28	2.15
92	1.31	1.10	1.14	1.70	2.50	3.26	3.38	3.03	2.71	2.15	1.82	1.55	2.14
93	1.17	1.25	1.47	2.20	3.04	3.23	2.95	2.61	2.23	1.88	1.48	1.56	2.09
94	1.84	1.72	1.75	2.15	2.54	2.75	2.73	2.36	2.19	1.87	1.63	1.56	2.09
95	1.23	1.09	1.01	1.26	1.48	1.57	1.46	1.38	1.28	0.80	0.70	0.86	1.17
96	0.96	0.88	0.83	1.28	1.66	1.93	1.81	2.02	1.70	1.46	1.09	1.12	1.40
97	1.09	1.29	1.66	2.21	2.54	2.64	2.63	2.47	2.19	1.70	1.57	1.54	1.96
98	1.59	1.79	2.05	2.63	2.78	2.81	2.59	2.39	2.01	1.81	1.69	1.52	2.14
99	1.67	1.46	1.83	2.13	2.44	2.56	2.28	2.09	1.85	1.61	1.62	1.34	1.91
1900	1.36	1.57	1.92	2.23	2.39	2.47	2.34	2.31	1.99	1.75	1.49	1.45	1.94
01	1.35	1.00	0.88	1.29	1.31	1.72	1.91	1.78	1.71	1.33	1.16	1.19	1.39
02	1.08	0.63	0.94	1.49	1.86	2.12	2.74	2.72	2.38	2.29	2.02	1.82	1.84
03	1.72	1.70	2.28	3.05	3.09	3.05	2.98	2.76	2.59	2.25	1.77	1.31	2.38
04	1.19	1.28	1.86	2.91	3.17	3.32	3.41	3.10	2.84	2.49	2.12	1.77	2.46
05	1.52	1.31	1.18	1.83	2.46	2.98	3.06	2.87	2.63	2.31	1.93	1.92	2.17
06	1.94	1.93	1.71	2.13	2.40	2.60	2.64	2.63	2.35	2.21	2.18	2.42	2.26
07	2.76	2.46	2.24	2.71	2.85	3.27	3.31	3.03	2.77	2.69	2.41	2.26	2.73
Mean	572.10	572.03	572.22	572.70	573.05	573.24	573.22	573.04	572.78	572.45	572.21	572.14	572.60

Authority, U.S. Lake Survey.

From January, 1860, to December, 1903, inclusive, data from U.S. Lake Survey Report for 1904, page 4097.

Readings from 1904 to 1907, inclusive, from U.S. Lake Survey Annual Reports.

NOTE.—Elevations depend on B.M. "I" 581.41 ft., U.S. Lake Survey, 1903 Levels.

TABLE 11.
WATER LEVELS OF LAKE ERIE.

Monthly mean elevations of water surface of Lake Erie, at Buffalo Breakwater Light-house, in feet above mean tide at New York.

YEAR	JAN.	FEB.	MAR	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
a1860	573.51	572.93	573.28	573.91	574.11	574.15	573.96	573.72	573.44	573.20	573.22	573.25	573.56
a 61	2.86	2.36	2.75	3.72	4.14	4.28	4.10	4.06	3.94	3.77	3.86	3.82	3.64
a 62	3.68	3.17	3.26	4.09	4.32	4.39	4.43	3.97	3.72	3.40	3.17	3.39	3.75
a 63	3.71	3.78	3.67	3.72	3.89	3.82	3.77	3.61	3.28	2.90	2.60	2.76	3.46
a 64	2.34	2.27	2.43	2.84	3.55	3.57	3.38	3.03	2.87	2.62	2.56	2.82	2.86
a 65	2.26	1.46	1.73	2.38	2.95	3.00	3.03	2.87	2.89	2.65	2.38	2.43	2.50
a 66	2.03	1.65	1.99	2.50	2.71	3.04	3.22	2.89	2.89	2.94	2.81	3.01	2.64
a 67	2.59	2.05	2.40	2.65	3.16	3.54	3.42	3.03	2.70	2.42	2.03	2.00	2.67
a 68	1.67	1.07	1.61	2.37	2.81	3.27	3.31	2.71	2.50	2.11	2.06	2.04	2.29
a 69	1.90	1.61	2.04	2.27	2.81	3.27	3.62	3.44	3.23	2.84	2.49	3.03	2.71
a1870	3.14	3.15	2.87	3.45	3.65	3.69	3.80	3.67	3.48	3.16	2.97	3.04	3.34
a 71	2.70	2.15	2.55	2.96	3.22	3.32	3.37	3.08	2.97	2.36	2.29	2.04	2.75
a 72	1.83	1.37	1.23	1.36	1.79	2.23	2.29	2.18	2.01	1.90	1.68	1.64	1.79
a 73	1.41	1.20	1.22	2.43	3.09	3.24	3.29	3.15	2.81	2.57	2.48	3.04	2.49
a 74	3.30	3.13	3.11	3.21	3.29	3.43	3.53	3.29	2.89	2.51	2.20	2.18	3.01
a 75	1.82	1.43	1.52	1.85	2.31	2.81	3.01	2.92	2.84	2.41	2.37	2.78	2.34
a 76	2.61	2.95	3.55	4.00	4.31	4.49	4.45	4.07	3.96	3.49	3.68	3.53	3.76
a 77	3.00	2.62	2.34	2.70	2.94	3.09	3.40	3.18	3.16	2.82	2.85	3.12	2.94
a 78	3.07	2.99	3.07	3.42	3.65	3.72	3.79	3.49	3.42	3.13	3.04	3.31	3.34
a 79	2.76	2.40	2.38	2.67	2.81	2.97	3.07	2.77	2.50	2.33	1.97	2.42	2.59
a1880	2.79	2.61	2.70	2.79	3.05	3.23	3.39	3.07	2.90	2.52	2.55	2.40	2.83
a 81	1.86	1.75	2.02	2.65	3.04	3.35	3.37	2.97	2.68	2.69	2.62	3.02	2.67
a 82	3.36	3.14	3.54	3.69	3.88	4.10	4.10	3.88	3.67	3.28	3.07	2.75	3.54
a 83	2.53	2.52	2.66	2.71	3.16	3.93	4.20	4.06	3.81	3.55	3.28	3.50	3.33
a 84	3.04	3.08	3.22	3.70	3.96	4.11	3.96	3.72	3.35	3.08	2.71	2.83	3.40
a 85	2.52	2.09	1.90	2.65	3.37	3.95	3.98	3.91	3.82	3.78	3.77	3.91	3.30
a 86	3.80	2.85	2.61	3.42	3.71	3.88	3.93	3.65	3.46	3.29	3.11	3.21	3.41
a 87	a 2.86	a 3.07	3.75	3.71	3.93	4.07	3.91	3.51	3.20	3.26	2.71	2.89	3.41
b 88	2.57	1.96	2.03	2.69	2.84	3.01	3.23	3.12	2.78	2.59	2.44	2.74	2.67
b 89	2.56	2.34	1.95	2.33	2.49	2.96	3.00	2.91	2.53	2.03	2.03	2.34	2.46
b1890	2.93	2.74	2.98	3.23	3.59	3.92	3.64	3.17	2.82	2.81	3.00	2.74	3.13
b 91	2.48	2.36	2.50	2.62	2.40	2.38	2.56	2.27	2.10	1.73	1.67	1.70	2.23
b 92	1.61	0.92	1.12	1.96	2.40	3.21	3.42	3.05	2.78	2.45	2.07	2.04	2.25
b 93	1.27	1.22	1.53	2.19	2.91	3.26	3.13	2.54	2.29	2.19	2.17	2.13	2.24
b 94	2.13	1.75	1.86	2.05	2.55	2.94	2.81	2.34	2.17	2.17	1.99	1.82	2.22
b 95	1.69	1.00	0.92	1.13	1.48	1.58	1.56	1.42	1.44	1.20	0.71	0.97	1.26
b 96	1.12	1.05	0.69	1.22	1.67	1.68	1.86	2.09	1.67	1.41	1.44	1.23	1.43
b 97	1.59	1.15	1.66	2.18	2.60	2.59	2.57	2.45	2.09	1.65	1.69	1.81	2.00
b 98	1.68	1.57	1.95	2.55	2.68	2.72	2.50	2.46	2.08	1.91	2.01	2.07	2.18
99	2.05	2.59	c 1.85	c 2.04	c 2.32	c 2.51	c 2.45	c 2.09	c 1.90	c 1.48	c 1.55	c 1.96	1.98
c1900	1.67	1.61	1.82	2.16	2.33	2.41	2.43	2.31	2.07	1.68	1.84	1.77	2.01
c 01	a 1.60	a 1.03	0.82	1.05	1.17	1.69	1.88	1.70	1.75	1.53	1.39	1.37	1.42
c 02	1.41	0.79	0.95	1.50	1.74	2.05	2.73	2.64	2.30	2.39	2.14	a 2.20	1.90
c 03	1.99	1.70	2.13	2.83	2.85	2.95	2.99	2.64	2.55	2.36	2.01	2.02	2.42
c 04	1.06	1.30	1.86	2.89	3.23	3.49	3.41	3.12	2.84	2.61	2.31	2.13	2.52
c 05	1.74	1.23	1.32	1.79	2.38	2.97	3.28	3.06	2.86	2.65	2.29	2.45	2.34
c 06	2.33	1.88	1.66	2.06	2.27	2.49	2.56	2.51	2.27	2.25	2.32	2.45	2.25
c 07	2.96	2.47	2.22	2.62	2.84	3.18	3.33	3.02	2.80	2.79	2.71	2.63	2.80
Mean	572.36	572.05	572.19	572.64	572.97	573.21	573.26	573.02	572.80	572.56	572.42	572.52	572.67

Authority, U.S. Lake Survey, except for supplied values.
a.—Supplied by applying to the Cleveland, O., readings, the mean monthly rise or fall between Cleveland, O., and Buffalo, N.Y., from June, 1899, to December, 1906, inclusive.
b.—Derived from U.S. Lake Survey tables by subtracting 0.1 foot from records there given.
c.—Self-registering gage.
NOTE.—Elevations depend on B.M. " Lighthouse," 590.101 ft., U.S. Lake Survey, 1903 Levels.

SESSIONAL PAPER No. 54.

TABLE 12.
WATER LEVELS OF LAKE ONTARIO.

Monthly mean elevations of water surface of Lake Ontario, at Charlotte, N.Y.,
in feet above mean tide at New York.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
1860	246.58	246.41	246.52	246.54	246.78	246.97	247.09	247.08	246.67	246.41	246.49	246.50	246.67
61	6.28	6.29	6.73	7.27	8.04	8.28	8.29	8.00	7.54	7.69	7.60	7.40	7.45
62	7.04	6.78	6.89	7.75	8.58	8.43	8.32	7.99	7.46	6.96	6.59	6.45	7.44
63	6.52	6.71	6.88	7.47	7.97	7.97	7.73	7.42	6.87	6.44	6.25	6.26	7.04
64	6.10	6.08	6.15	6.69	7.74	8.07	7.67	7.29	6.76	6.47	6.56	6.78	6.86
65	6.51	6.17	6.58	7.21	7.47	7.44	7.24	6.75	6.39	6.04	5.72	5.64	6.60
66	5.45	5.22	5.53	5.88	6.34	7.08	6.85	6.63	6.49	6.37	6.39	6.85	6.26
67	6.79	6.77	6.90	7.31	8.10	8.40	8.08	8.09	7.89	7.35	5.56	5.34	7.21
68	5.16	4.80	5.16	5.82	6.35	6.70	6.57	6.36	6.13	5.43	5.54	5.52	5.79
69	5.38	5.51	5.70	6.44	7.03	7.20	7.47	7.42	7.27	6.97	6.56	6.71	6.64
1870	7.24	7.39	7.32	8.35	9.03	8.81	8.54	8.09	7.49	7.14	6.72	6.52	7.72
71	6.30	6.08	6.37	7.03	7.32	7.25	7.08	6.64	6.30	5.73	5.35	4.78	6.35
72	4.63	4.43	4.30	4.72	4.96	5.28	5.34	5.19	4.94	4.84	4.73	4.54	4.82
73	4.47	4.38	4.55	6.23	6.91	6.96	6.90	6.66	6.22	5.86	5.70	5.83	5.89
74	6.30	6.64	7.08	7.19	7.32	7.28	7.39	7.14	6.64	6.03	5.50	5.20	6.64
75	4.85	4.52	4.68	5.46	5.81	5.86	6.01	5.83	5.60	5.35	5.17	5.07	5.35
76	5.48	6.11	6.70	7.62	8.30	8.42	8.44	8.02	7.35	7.00	6.66	6.39	7.21
77	5.98	5.74	5.85	6.46	6.60	6.41	6.54	6.27	5.86	5.46	5.32	5.46	6.00
78	5.60	5.83	6.34	6.74	7.06	7.05	7.08	6.97	6.82	6.38	6.35	7.03	6.60
79	6.80	6.45	6.47	6.73	6.88	6.91	6.72	6.34	5.94	5.50	5.10	5.12	6.25
1880	5.34	5.63	5.95	6.18	6.38	6.52	6.53	6.16	5.85	5.37	5.27	5.07	5.85
81	4.76	4.85	5.42	5.79	6.09	6.29	6.33	6.00	5.56	5.24	5.24	5.22	5.57
82	5.74	5.94	6.51	6.82	7.09	7.59	7.59	7.22	6.83	6.35	5.86	5.56	6.59
83	5.32	5.39	5.60	6.16	6.76	7.39	7.85	7.70	7.26	6.84	6.59	6.49	6.61
84	6.44	6.85	7.35	8.03	8.16	8.05	7.91	7.65	7.15	6.75	6.22	6.09	7.22
85	6.06	5.78	5.54	6.28	7.07	7.40	7.55	7.36	7.17	6.97	7.00	7.18	6.78
86	7.55	7.56	7.58	8.36	8.59	8.34	7.95	7.50	7.09	6.72	6.43	6.36	7.50
87	6.15	6.84	7.27	7.56	8.08	8.07	7.78	7.29	6.69	6.21	5.72	5.57	6.94
88	5.45	5.26	5.48	5.98	6.19	6.24	6.18	6.01	5.78	5.43	5.31	5.28	5.72
89	5.39	5.69	5.76	5.93	6.18	6.62	6.76	6.52	5.97	5.66	5.33	5.55	5.94
1890	6.16	6.47	6.78	6.99	7.38	7.96	7.89	7.32	6.85	6.62	6.57	6.34	6.94
91	6.02	6.10	6.65	7.27	7.19	6.78	6.47	6.10	5.68	5.04	4.34	4.36	6.00
92	4.57	4.51	4.50	4.90	5.15	5.73	6.25	6.17	5.90	5.48	5.16	5.07	5.28
93	5.06	4.73	5.11	5.81	7.04	7.31	7.09	6.49	6.21	5.77	5.27	5.09	5.92
94	5.43	5.65	6.02	6.09	6.26	6.73	6.52	5.95	5.44	5.15	4.87	4.54	5.72
95	4.55	4.39	4.40	4.74	4.96	4.79	4.53	4.26	4.04	3.64	3.41	3.51	4.27
96	3.77	4.06	4.28	5.15	5.44	5.35	5.13	4.89	4.51	4.29	4.03	3.98	4.57
97	3.84	3.85	4.30	4.96	5.52	5.69	5.63	5.63	5.17	4.58	4.38	4.47	4.84
98	4.70	5.09	5.48	5.90	6.12	6.16	5.88	5.47	5.11	4.83	4.78	4.74	5.36
99	4.88	4.78	5.07	5.61	6.01	6.15	5.95	5.56	5.04	4.71	4.59	4.39	5.23
1900	4.53	4.64	5.08	5.67	6.02	6.00	5.86	5.61	5.17	4.85	4.63	4.87	5.24
01	4.82	4.75	4.50	5.51	5.95	6.07	5.89	5.53	5.21	4.76	4.35	4.35	5.14
02	4.53	4.47	5.03	5.56	5.65	5.67	6.09	6.22	5.81	5.54	5.18	4.96	5.39
03	4.98	5.09	5.68	6.65	6.69	6.60	6.67	6.48	6.20	5.80	5.44	a 5.69	5.95
a 04	4.87	5.05	5.65	6.95	7.63	7.98	8.05	7.79	7.37	6.95	6.32	5.95	6.71
a 05	5.93	5.59	5.55	6.10	6.33	6.74	7.10	7.08	6.91	6.57	6.22	6.09	6.35
06	a 6.36	a 6.36	a 6.14	a 6.35	a 6.51	a 6.60	a 6.75	a 6.45	a 6.03	5.84	5.79	5.91	6.26
07	6.43	6.66	6.62	6.96	7.21	7.27	7.30	7.02	6.68	6.54			
Mean	245.61	245.63	245.88	246.44	246.84	246.98	246.93	246.66	246.28	245.92	245.62	245.56	

Authority, U.S. Lake Survey.
a.—From self-registering gage.
NOTE.—Elevations depend on B.M. "I" 283.168 ft., U.S. Lake Survey, 1903 Levels.

TABLE 13.
WATER LEVELS OF LAKE ONTARIO.

Monthly mean elevations of water surface of Lake Ontario, at Oswego, N.Y., in feet above mean tide at New York.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
1860	246.58	246.72	246.77	246.80	247.03	247.57	247.82	247.26	246.86	246.67	246.75	246.73	246.96
61	6.44	6.56	7.01	7.23	8.18	8.54	8.32	8.07	7.60	7.81	7.82	7.61	7.60
62	7.11	6.69	7.18	8.08	8.88	8.62	8.72	8.26	7.61	7.08	6.73	6.62	7.63
63	6.77	6.83	6.91	7.63	8.03	8.18	7.77	7.31	6.93	6.74	6.56	6.57	7.19
64	6.33	6.17	6.26	6.83	7.82	8.12	7.80	7.34	6.81	6.58	6.55	6.65	6.94
65	7.08	7.23	7.38	7.46	7.62	7.66	7.51	6.90	6.29	6.07	5.82	5.66	6.89
66	5.46	5.47	5.48	5.96	6.02	5.92	6.84	6.74	6.65	6.52	6.28	6.20	6.13
67	5.95	5.92	6.62	7.52	8.21	8.48	8.11	7.48	6.98	6.33	5.59	4.83	6.84
68	4.51	4.61	4.88	5.52	6.12	6.54	6.42	6.13	5.94	5.35	5.20	5.37	5.55
69	5.22	5.34	5.56	6.09	6.75	6.97	7.29	7.35	7.17	7.08	6.68	6.85	6.53
1870	7.26	7.41	7.41	8.35	8.95	8.63	8.31	7.97	7.28	6.95	6.38	6.13	7.59
71	6.06	5.89	6.10	6.70	7.12	7.06	6.90	6.46	6.12	5.62	5.21	4.90	6.18
72	4.73	4.51	4.35	4.84	4.96	5.29	5.35	5.19	4.90	4.74	4.69	4.35	4.82
73	4.31	4.38	4.50	6.46	7.00	6.92	6.88	6.60	6.18	5.73	5.60	5.79	5.86
74	6.35	6.75	7.30	7.19	7.17	7.26	7.21	6.98	6.34	5.94	5.37	5.03	6.57
75	4.73	4.38	4.64	5.44	5.71	5.87	5.90	5.76	5.55	5.27	5.08	4.90	5.27
76	5.31	5.97	6.52	7.50	8.08	8.30	8.37	7.91	7.30	6.96	6.60	6.42	7.10
77	5.89	5.62	5.77	6.46	6.53	6.43	6.47	6.20	5.77	5.34	5.25	5.38	5.93
78	5.48	5.69	6.39	6.64	6.98	6.97	6.93	6.85	6.59	6.33	6.21	7.02	6.51
79	6.81	6.45	6.30	6.71	6.80	6.83	6.67	6.32	5.90	5.46	5.07	5.10	6.20
1880	5.32	5.60	5.94	6.12	6.27	6.51	6.52	6.09	5.72	5.31	5.27	5.10	5.81
81	4.74	4.73	5.39	5.81	5.99	6.21	6.28	5.96	5.40	5.18	5.10	5.18	5.50
82	5.73	5.90	6.50	6.83	7.02	7.53	7.52	7.19	6.81	6.30	5.88	5.59	6.57
83	5.32	5.38	5.62	6.14	6.79	7.49	8.02	7.84	7.36	6.92	6.69	6.55	6.68
84	6.51	6.88	7.56	8.17	8.19	8.09	7.88	7.65	7.22	6.80	6.30	6.15	7.28
85	6.14	5.87	5.59	6.27	7.07	7.44	7.58	7.43	7.21	7.02	7.07	7.24	6.83
86	7.60	7.67	7.81	8.43	8.64	8.44	8.04	7.60	7.24	6.95	6.51	6.42	7.61
87	6.17	6.92	7.43	7.64	8.20	8.16	7.88	7.37	6.76	6.37	6.02	5.75	7.06
88	5.44	5.30	5.54	6.17	6.24	6.28	6.34	6.24	5.85	5.49	5.42	5.41	5.81
89	5.62	5.76	5.93	6.17	6.32	6.63	6.82	6.57	6.01	5.57	5.17	5.74	6.03
1890	6.25	6.60	6.93	7.17	7.53	8.16	7.99	7.32	6.97	6.64	6.72	6.51	7.07
91	6.19	6.45	6.99	7.47	7.25	6.83	6.55	6.11	5.68	5.04	4.44	4.41	6.12
92	4.51	4.48	4.61	5.19	5.25	5.81	6.32	6.24	6.04	5.60	5.33	5.20	5.38
93	4.87	4.76	5.24	5.99	7.15	7.37	7.11	6.57	6.30	5.78	5.37	5.22	5.98
94	5.56	5.74	6.04	6.09	6.27	6.80	6.60	6.02	5.51	5.26	4.93	4.58	5.78
95	4.49	4.43	4.33	4.88	5.00	4.88	4.59	4.34	4.00	3.66	3.41	3.44	4.29
96	3.80	4.26	4.49	5.41	5.43	5.35	5.08	4.94	4.46	4.23	3.97	3.97	4.62
97	3.88	3.82	4.32	4.96	5.40	5.61	5.61	5.60	5.10	4.47	4.41	4.47	4.80
98	4.64	5.08	5.48	5.92	6.08	6.13	5.85	5.50	5.09	4.84	4.89	4.90	5.37
99	4.98	4.88	5.13	5.69	5.94	6.07	5.92	5.46	a 4.95	a 4.55	a 4.42	a 4.36	5.20
a 1900	4.63	4.88	5.19	5.80	5.99	5.91	5.82	5.54	5.12	4.72	4.55	4.84	5.25
a 01	4.68	4.62	4.39	5.63	5.91	5.99	5.74	5.42	5.10	4.65	4.28	4.36	5.06
a 02	4.42	4.30	4.95	5.40	5.47	5.55	5.97	6.11	5.66	5.42	5.05	4.89	5.27
a 03	4.92	5.16	5.75	6.44	6.56	6.44	6.59	6.35	6.07	5.72	5.36	5.11	5.87
04	4.72	5.00	5.63	7.00	7.61	7.87	7.89	7.64	7.25	6.87	6.36	5.81	6.64
05	5.79	5.49	5.29	6.13	6.25	6.59	6.98	6.90	6.75	6.45	6.07	5.88	6.21
06	6.13	6.09	5.91	6.25	6.38	6.41	6.57	6.26	5.81	5.48	5.58	5.74	6.05
07	6.34	6.46	6.47	6.85	7.08	7.11	7.12	6.90	6.50	6.48	6.33	6.33	6.66
Mean	245.58	245.67	245.91	246.49	246.82	246.95	246.93	246.63	246.22	245.88	245.63	245.57	246.19

Authority, U.S. Lake Survey.
a.—Self-registering gage.
Floods in Oswego River during the spring may cause abnormal gage readings from 0.2 to 0.3 foot above the true mean stage of Lake Ontario.
NOTE.—Elevations depend on zero of gage, 244.12 ft., and B.M. "A," 251.90 ft., U.S. Lake Survey, 1903 Levels.

SESSIONAL PAPER No. 54.

TABLE 14.
WATER LEVELS OF ST. LAWRENCE RIVER.

Monthly mean elevations of water surface of St. Lawrence River, at Ogdensburg, N.Y., in feet above mean tide at New York.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
a1860	245.65	245.78	245.83	245.86	246.07	246.58	246.82	246.29	245.91	245.73	245.81	245.79	246.01
a 61	5.52	5.63	6.05	6.26	7.16	7.50	7.29	7.05	6.61	6.81	6.82	6.62	6.61
a 62	6.15	5.75	6.21	7.06	7.82	7.57	7.67	7.23	6.62	6.12	5.79	5.69	6.64
a 63	5.83	5.88	5.96	6.64	7.02	7.16	6.77	6.34	5.98	5.80	5.63	5.64	6.22
a 64	5.41	5.26	5.35	5.88	6.82	7.10	6.80	6.37	5.87	5.65	5.62	5.72	5.99
a 65	6.12	6.26	6.40	6.48	6.63	6.67	6.53	5.95	5.38	5.17	4.93	4.78	5.94
a 66	4.59	4.60	4.61	5.06	5.12	5.03	5.89	5.80	5.72	5.59	5.37	5.29	5.22
a 67	5.06	5.03	5.69	6.54	7.19	7.44	7.09	6.50	6.03	5.41	4.72	4.00	5.89
a 68	3.70	3.79	4.05	4.65	5.22	5.61	5.50	5.23	5.05	4.49	4.35	4.51	4.68
69	a 4.37	a 4.48	a 4.69	a 5.19	a 5.81	6.18	6.41	6.41	6.16	6.08	5.70	6.04	5.63
1870	6.32	6.36	6.16	7.35	7.87	7.60	7.36	7.03	6.19	5.87	5.64	a 5.23	6.58
71	a 5.16	a 5.00	a 5.20	a 5.76	6.02	6.28	6.01	5.66	5.34	4.99	4.39	a 4.07	5.32
72	a 3.91	a 3.70	a 3.55	a 4.01	4.31	4.53	4.77	4.66	4.59	4.09	a 3.87	a 3.55	4.13
73	a 3.51	a 3.58	a 3.69	a 5.54	6.15	6.18	6.20	a 5.67	a 5.27	a 4.85	a 4.73	a 4.90	5.02
74	a 5.43	a 5.81	a 6.33	a 6.22	a 6.21	a 6.29	a 6.24	6.16	a 5.42	a 5.05	a 4.51	a 4.19	5.66
a 75	3.91	3.58	3.82	4.57	4.83	4.98	5.01	4.88	4.68	4.41	4.24	4.07	4.42
a 76	4.45	5.07	5.59	6.52	7.06	7.27	7.34	6.90	6.33	6.01	5.67	5.50	6.14
a 77	5.00	4.74	4.89	5.54	5.60	5.51	5.55	5.29	4.89	4.48	4.40	4.52	5.03
a 78	4.61	4.81	5.47	5.71	6.03	6.02	5.98	5.90	5.66	5.41	5.30	6.06	5.58
a 79	5.87	5.53	5.39	5.77	5.86	5.88	5.73	5.40	5.01	4.59	4.23	4.25	5.29
a1880	4.46	4.73	5.05	5.22	5.36	5.58	5.59	5.19	4.84	4.45	4.41	4.25	4.93
a 81	3.91	3.91	4.53	4.92	5.09	5.30	5.37	5.06	4.54	4.33	4.33	4.33	4.64
a 82	4.85	5.01	5.57	5.88	6.06	6.54	6.54	6.22	5.87	5.39	4.99	4.72	5.64
a 83	4.46	4.52	4.74	5.23	5.85	6.51	7.01	6.84	6.38	5.97	5.75	5.62	5.74
84	a 5.58	a 5.93	a 6.57	a 7.15	a 7.17	a 7.07	a 6.87	a 6.66	6.39	5.97	5.55	a 5.24	6.35
85	a 5.23	a 4.98	a 4.72	a 5.36	a 6.11	6.47	a 6.59	a 6.45	a 6.24	6.05	a 6.11	a 6.27	5.88
a 86	6.61	6.68	6.81	7.39	7.59	7.40	7.03	6.61	6.27	6.00	5.58	5.50	6.62
87	a 5.26	a 5.97	a 6.45	a 6.65	7.14	7.08	6.90	a 6.39	a 5.82	a 5.45	a 5.12	a 4.87	6.09
a 88	4.57	4.44	4.67	5.26	5.33	5.37	5.42	5.33	4.96	4.62	4.56	4.55	4.92
a 89	4.74	4.88	5.04	5.26	5.40	5.70	5.88	5.64	5.11	4.70	4.32	4.86	5.13
1890	a 5.34	a 5.67	a 5.98	a 6.21	6.59	7.00	6.97	6.12	a 6.02	a 5.71	a 5.78	a 5.58	6.08
91	a 5.28	a 5.53	a 6.04	a 6.49	a 6.28	5.72	5.49	5.07	4.71	4.29	3.99	a 3.60	5.21
92	a 3.70	a 3.67	a 3.79	a 4.34	a 4.40	a 4.92	5.26	5.15	5.21	4.67	4.36	a 4.35	4.48
a 93	4.04	3.93	4.39	5.09	6.19	6.39	6.15	5.64	5.39	4.90	4.51	4.37	5.08
a 94	4.69	4.86	5.14	5.19	5.36	5.86	5.67	5.12	4.64	4.40	4.09	3.76	4.90
a 95	3.68	3.62	3.53	4.05	4.16	4.05	3.77	3.54	3.22	2.90	2.66	2.69	3.49
a 96	3.03	3.46	3.68	4.55	4.57	4.49	4.24	4.10	3.65	3.43	3.19	3.19	3.80
a 97	3.10	3.05	3.52	4.12	4.54	4.73	4.73	4.73	4.25	3.66	3.60	3.66	3.97
a 98	3.82	4.24	4.61	5.03	5.18	5.23	4.96	4.63	4.24	4.01	4.06	4.07	4.51
a 99	4.14	4.05	4.28	4.81	5.05	5.17	5.03	4.59	4.11	3.74	3.61	3.56	4.34
1900	a 3.81	a 4.05	a 4.34	a 4.91	a 5.09	a 5.02	a 4.93	a 4.67	b 4.14	b 3.85	b 3.69	b 3.96	4.37
b 01	3.78	3.55	3.38	4.35	4.82	4.99	4.81	4.53	4.26	3.84	3.44	3.54	4.11
02	b 3.57	b 3.57	b 4.14	b 4.67	b 4.62	b 4.71	b 5.06	b 5.12	b 4.80	b 4.51	b 4.21	a 4.06	4.42
b 03	3.97	4.00	4.68	5.48	5.60	5.43	5.57	5.35	5.13	4.70	4.47	4.24	4.88
04	a 3.90	b 4.04	b 4.47	b 5.86	b 6.45	b 6.75	b 6.82	b 6.64	b 6.22	b 5.89	b 5.36	b 4.81	5.60
a 05	4.91	4.53	4.24	5.09	5.28	5.64	5.95	5.85	5.76	5.48	5.24	5.03	5.25
a 06	5.30	5.11	4.95	5.21	5.38	5.42	5.56	5.31	4.92	4.68	4.62	4.64	5.09
a 07	5.20	5.42	5.32	5.74	6.03	6.05	6.12	5.90	5.51	5.42	5.31	5.34	5.61
Mean	244.70	244.75	244.99	245.54	245.86	246.00	245.98	245.69	245.32	244.99	244.76	244.69	245.27

Authority, U.S. Lake Survey, except for supplied values.
a.—Supplied from Oswego, N.Y., readings by formula (Ogdensburg—240) = 0.9426 (Oswego—240) — 0.553.
b.—Self-registering gage.
NOTE.—Elevations depend on zero of gage, 244.63 ft., and B.M. " O," 247.126 ft., U.S. Lake Survey, 1903 Levels.

TABLE 15.
WATER LEVELS OF ST. LAWRENCE RIVER.

Monthly mean elevations of water surface of St. Lawrence River, at Lock No. 27, Galop Canal, head of Galop Rapids, in feet above mean tide at New York

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
a1860	244.08	244.22	244.26	244.29	244.80	245.31	245.55	245.02	244.64	244.46	244.54	244.22	244.62
a 61	3.95	4.07	4.49	4.70	5.89	6.23	6.02	5.79	5.34	5.54	5.55	5.06	5.22
a 62	4.59	4.19	4.65	5.50	6.55	6.31	6.40	5.97	5.35	4.85	4.52	4.12	5.25
a 63	4.26	4.32	4.40	5.08	5.75	5.89	5.50	5.07	4.71	4.53	4.36	4.08	4.83
a 64	3.85	3.70	3.78	4.32	5.55	5.83	5.53	5.10	4.60	4.38	4.35	4.15	4.60
a 65	4.56	4.70	4.84	4.92	5.36	5.40	5.26	4.68	4.10	3.90	3.66	3.21	4.55
a 66	3.03	3.04	3.04	3.50	3.85	3.75	4.62	4.53	4.44	4.32	4.09	3.73	3.83
a 67	3.49	3.46	4.12	4.97	5.92	6.17	5.82	5.23	4.76	4.14	3.44	2.43	4.50
a 68	2.93	2.22	2.48	3.08	3.94	4.34	4.22	3.95	3.77	3.21	3.07	2.94	3.35
a 69	2.80	2.91	3.12	3.62	4.54	4.75	5.05	5.11	4.94	4.85	4.47	4.34	4.21
a1870	4.73	4.87	4.87	5.76	6.62	6.32	6.01	5.69	5.04	4.73	4.19	3.66	5.21
a 71	3.59	3.43	3.63	4.20	4.89	4.83	4.68	4.26	3.94	3.47	3.08	2.50	3.88
a 72	2.34	2.13	1.98	2.44	2.85	3.16	3.21	3.06	2.79	2.64	2.59	1.98	2.60
a 73	1.94	2.00	2.12	3.97	4.77	4.70	4.66	4.40	4.00	3.57	3.45	3.34	3.58
a 74	3.87	4.24	4.77	4.66	4.94	5.02	4.97	4.76	4.15	3.77	3.23	2.62	4.25
75	1.45	0.46	1.77	3.24	3.61	3.80	3.79	3.62	3.53	3.15	2.81	2.77	2.83
76	2.91	3.73	4.02	5.35	5.95	6.23	6.25	5.64	4.99	4.92	4.20	3.67	4.82
77	2.37	3.17	3.57	3.80	4.51	4.38	4.56	4.05	3.51	2.90	3.00	2.99	3.57
78	2.97	3.20	4.01	4.63	5.20	b 4.74	4.63	4.53	4.31	3.99	3.84	4.95	4.25
79	3.39	3.75	3.81	4.36	4.44	4.54	4.50	3.86	3.45	2.86	2.94	2.90	3.73
1880	3.03	b 3.48	3.60	4.04	4.14	4.33	4.33	3.91	3.60	3.27	3.29	2.74	3.65
81	1.02	1.56	2.83	3.53	3.72	3.93	4.04	3.72	3.39	3.02	3.06	3.10	3.08
82	3.20	3.44	4.07	4.84	4.69	5.40	5.34	4.95	4.46	4.10	3.67	3.51	4.31
83	1.87	2.01	2.76	3.78	4.56	5.37	5.77	5.58	5.10	4.66	4.59	4.42	4.21
84	3.29	3.76	4.46	5.71	5.92	b 5.81	b 5.61	5.52	5.15	4.67	4.33	4.13	4.86
85	3.73	2.52	2.73	3.69	4.96	5.35	5.45	5.30	5.11	4.87	4.86	5.07	4.47
86	5.15	5.06	5.02	5.90	6.49	6.28	5.83	5.47	5.16	4.76	4.62	4.31	5.34
87	3.97	4.22	4.69	5.39	5.91	5.95	5.67	5.17	4.72	4.40	3.90	3.64	4.80
88	3.49	2.27	2.27	4.05	4.20	4.23	4.22	4.08	3.91	3.26	3.17	3.30	3.54
89	3.51	2.87	3.43	4.01	4.19	4.51	4.61	4.35	3.83	3.12	3.15	3.46	3.75
1890	4.10	4.13	4.64	4.98	5.26	5.89	5.74	b 5.09	b 4.79	4.38	4.32	3.44	4.73
91	3.41	3.48	4.30	5.13	4.93	4.52	4.38	3.99	3.50	2.83	2.59	2.42	3.79
92	2.33	1.83	1.98	2.97	3.16	3.59	4.21	4.03	b 3.87	3.44	3.09	3.10	3.11
93	2.27	1.71	2.29	3.66	4.80	5.12	4.81	4.27	4.17	3.60	3.20	3.08	3.58
94	3.16	2.44	3.49	3.82	4.04	4.61	4.40	3.81	3.37	3.15	2.95	2.39	3.47
95	2.16	1.32	1.59	2.64	2.97	2.81	2.51	2.36	2.11	1.77	1.56	1.72	2.13
96	1.80	1.93	1.86	3.06	3.46	3.29	3.17	3.02	2.54	2.32	2.22	2.04	2.56
97	1.91	1.75	2.25	3.12	3.34	3.73	3.64	3.63	3.07	2.57	2.30	2.37	2.81
98	2.44	2.52	3.58	3.21	3.54	3.59	3.32	3.24	2.85	2.58	2.56	2.61	3.00
99	2.70	2.24	2.72	3.35	3.66	3.84	3.68	3.27	2.81	2.40	2.28	2.35	2.94
1900	2.30	2.35	2.35	3.38	3.54	3.70	3.64	3.26	3.01	2.62	2.37	2.65	2.93
01	2.48	2.13	1.88	3.02	3.58	3.70	3.50	3.21	2.97	2.46	2.00	2.18	2.76
02	c 1.24	c 0.24	c 2.44	c 3.24	c 3.34	c 3.44	c 3.74	c 3.84	c 3.54	b 3.28	c 3.04	c 2.74	2.89
c 03	2.54	2.54	3.24	4.14	4.34	4.14	4.34	4.04	3.54	3.44	3.14	3.04	3.53
04	c 2.54	c 2.54	c 3.04	c 4.54	b 5.35	c 5.54	c 5.74	c 5.38	c 5.00	b 4.65	c 4.08	c 3.34	4.31
c 05	3.08	2.78	2.44	3.68	4.04	4.28	4.70	4.44	4.44	4.28	3.88	3.58	3.80
c 06	3.98	3.66	3.51	3.86	4.01	4.14	4.24	3.96	3.52	3.42	3.38	3.29	3.75
c 07	3.35	3.47	3.63	4.42	4.73	4.78	4.85	4.63	4.19	4.16	4.06	3.93	4.18
Mean	243.07	242.96	243.35	244.12	244.60	244.75	244.72	244.41	244.04	243.70	243.48	243.28	243.87

Authority, U.S. Lake Survey, except for supplied values.

a.—Supplied from Oswego readings by formula (Lock 27—240)=0.9457 (Oswego—240)—1.845 assuming a mean fall during entire period.

b.—Supplied from Oswego readings by formula (Lock 27—240)=0.9457 (Oswego—240)—1.845.

c.—Deduced from the water records of the St. Lawrence canals furnished the International Waterways Commission.

NOTE.—Elevations depend on zero of gage, sill of Lock No. 27, 234.144 ft.

TABLE 16.
WATER LEVELS OF ST. LAWRENCE RIVER.

Monthly mean elevations of water surface of St. Lawrence River, at Lock No. 24, Morrisburg Canal, head of Rapide Plat, in feet above upper sill of old lock.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
1880	8.32		8.79	9.49	9.74	9.95	9.89	9.28	8.84	8.34	8.61	7.85	9.01
81	5.69	6.74	7.94	8.77	9.02	9.36	9.56	9.17	8.53	7.89	8.45	8.55	8.31
82	8.54	8.59	9.55			10.77	10.53	10.22	9.89	9.46	8.62	8.52	9.47
83	7.57	5.90	7.65	9.14	9.93	10.78	11.15	11.05	11.06	10.12	9.83	9.58	9.48
84	7.49	8.15	12.41	10.90	11.78	11.61	11.31	11.15	10.85	9.83	9.20	8.64	10.28
85	7.90	7.18	7.55	8.51	10.21	10.61	10.74	10.58	10.09	10.05	9.94	10.39	9.48
86	10.18	10.09	10.32	11.58	11.84	11.71	11.22	10.62	10.40	10.03	9.86	9.69	10.63
87	8.77	10.40	11.13	11.13	11.44	11.41	11.06	10.46	10.07	9.68	8.99	8.48	10.25
88	7.79	6.55	7.50	9.38	9.87	9.83	9.46	9.39	8.97	8.43	8.41	8.36	8.66
89	8.71	8.16	7.96	9.50	9.48	9.92	10.05	9.79	9.13	8.32	7.95	8.77	8.98
1890	9.34	9.54	10.02	10.46		11.47	11.42	10.51	10.21	9.73	9.70	9.36	10.16
91	8.64	8.74	9.60	9.40	10.64	9.97	9.88	9.26	8.68	7.82	7.36	7.30	8.94
92	7.02	5.83	6.44	7.74	7.98	8.74	9.52	9.30	9.22	8.51	8.13	7.98	8.03
93	5.25	7.50	8.63	8.92	10.36	10.80	10.52	9.65	9.48	8.87	8.33	8.06	8.86
94	7.98	6.61	8.71	9.13	9.35	10.18	9.86	9.01	8.40	8.06	7.77	7.32	8.53
95	6.61	5.45	6.09	9.47	7.82	7.65	7.33	7.10	6.54	6.16	5.69	5.81	6.81
96	5.65	6.35	7.73	7.99	8.32	8.28	7.99	7.73	7.09	6.66	6.65	6.35	7.23
97	6.03	5.42	6.45	7.86	8.42	8.76	8.53	8.58	7.81	7.07	6.76	7.07	7.40
98	7.04	7.61	8.35	8.74	9.04	9.10	8.74	8.38	7.83	7.44	7.40	7.59	8.10
99	7.00	6.65	7.53	8.54	8.86	9.16	8.85	8.15	7.55	7.03	7.04	7.01	7.78
1900	6.91	6.89	7.16	8.50	8.88	8.93	8.84	8.32	7.90	7.40	7.12	7.59	7.87
01	7.29	7.00	7.14	8.14	8.65	9.03	8.73	8.37	8.18	7.65	7.09	7.04	7.86
a 02	7.00	5.80	7.80	8.60	8.70	8.90	9.10	9.40	8.11	8.60	8.30	7.10	8.12
a 03	8.00	7.70	8.90	9.90	9.11	9.80	9.11	9.80	9.10	8.90	8.00	7.70	8.84
a 04	6.90	7.10	7.80	9.80	10.50	10.10	11.00	10.86	10.26	10.00	9.20	8.20	9.31
a 05	7.16	10.40	9.20	9.10	9.10	9.46	9.90	9.90	9.70	9.40	9.00	8.90	9.27
a 06	9.08	8.78	8.57	9.00	9.25	9.41	9.52	9.18	8.65	8.44	8.28	8.22	8.86
a 07	8.08	8.45	9.39	10.30	10.07	10.17	10.24	10.00	10.02	9.90	9.19	9.17	9.58
Mean	7.57	7.54	8.44	9.26	9.55	9.85	9.79	9.47	9.02	8.56	8.25	8.09	8.78

Authority, U.S. Lake Survey, except for supplied values.

a.—Deduced from the water records of the St. Lawrence canals furnished the International Waterways Commission.

TABLE 17.

WATER LEVELS OF ST. LAWRENCE RIVER.

Monthly mean elevations of water surface of St. Lawrence River, at Lock No. 21, Cornwall Canal head of Long Sault Rapids, in feet above upper sill of old lock.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
1870	10.99	10.94	10.70	12.00	12.54	12.43	12.25	11.85	11.20	11.07	10.62	10.36	11.41
71	9.89	9.71	10.32	10.74	11.06	11.08	10.91	10.54	10.24	9.87	9.34	9.03	10.23
72	8.44	7.75	8.02	8.78	9.21	9.53	9.57	9.37	9.11	8.97	9.08	8.67	8.88
73	9.50	8.98	9.20	10.10	10.81	10.97	10.90	10.58	10.34	9.92	9.74	10.02	10.09
74	10.30	10.31	11.06	11.08	11.19	11.30	11.23	10.95	10.41	10.13	9.74	9.33	10.59
75	8.41	7.43	8.53	9.41	9.88	10.05	10.12	9.92	9.65	9.37	9.20	9.11	9.26
76	9.46	9.83	10.16	11.43	11.91	12.11	12.15	11.71	11.18	11.02	10.57	10.64	11.01
77	10.04	10.06	10.17	10.41	10.59	10.51	10.56	10.27	9.87	9.43	9.37	9.59	10.06
78	9.44	9.40	10.21	10.62	10.92	10.93	10.85	10.84	10.73	10.41	10.33	11.00	10.47
79	10.44	9.51	9.52	10.60	10.86	10.84	10.68	10.29	9.99	9.58	9.31	9.10	10.06
1880	9.40	9.85	9.83	10.32	10.45	10.61	10.55	10.99	9.82	9.46	9.59	9.34	9.94
81	8.18	7.18	9.02	9.77	10.01	10.25	10.29	9.96	9.59	9.33	9.35	9.30	9.35
82	9.60	9.54	10.40	10.65	10.80	11.38	11.36	11.01		10.21	9.75	9.63	10.39
83	9.11	8.91	9.07	9.99	10.64	11.29	11.67	11.55	11.21	10.62	10.66	10.42	10.43
84	10.59	10.79	10.63	11.73	11.82	11.66	11.60	11.37	10.98	10.54	10.23	9.94	10.99
85	9.90	9.93	9.50	9.87	10.82	11.24	11.22	11.03	10.84	10.66	10.76	10.99	10.56
86	10.80	9.57	10.50	11.91	12.17	12.02	11.70	11.32	11.02	10.68	10.52	10.42	11.05
87	11.06	11.79	11.81	11.52	11.80	11.77	11.52	11.05	10.54	10.28	9.73	9.62	11.04
88	9.52	8.81	9.63	10.09	10.18	10.23	10.24	10.20	9.88	9.55	9.48	9.53	9.78
89	9.68	8.94	9.30	10.23	10.24	10.61	10.75	10.48	10.00	9.51	9.31	9.80	9.90
1890	10.24	10.23	10.72	11.07	11.42	11.83	11.76	11.21	10.94	10.53	10.62	10.39	10.91
91	10.08	9.80	10.55	11.33	11.15	10.66	10.50	10.15	9.76	9.06	8.75	8.79	10.05
92	8.66	7.67	8.37	9.29	9.30	9.86	10.40	10.18	10.14	9.73	9.46	15.52	9.88
93	14.80	15.20	15.29	16.32	10.90	11.12	10.94	10.39	10.33	9.78	9.51	9.21	11.98
94	9.32	8.18	9.73	9.99	10.15	10.66	10.44	9.94	9.55	9.26	9.04	8.62	9.57
95	8.46	6.93	7.38	8.86	8.97	8.92	8.64	8.62	8.23	7.95	7.64	7.57	8.18
96	8.26	8.68	8.54	9.28	9.42	9.38	9.19	9.02	8.54	8.19	8.22	7.99	8.73
97	7.85	7.46	8.49	9.07	9.48	9.69	9.59	9.56	9.01	8.45	8.33	8.48	8.79
98	8.48	9.59	9.51	9.66	9.82	9.84	9.64	9.37	9.03	8.65	8.67	8.77	9.25
99	8.70	8.56	9.63	9.48	9.73	9.93	9.72	9.25	8.85	8.45	8.38	8.54	9.10
1900	8.39	8.59	6.55	9.68	9.87	9.91	9.86	9.56	9.30	8.85	8.71	9.60	9.02
01	8.86	9.21	9.03	9.57	9.88	10.02	9.75	9.50	9.27	8.93	8.44	8.61	9.26
a 02	8.80	13.40	9.00	9.40	9.70	9.90	10.10	10.20	9.10	9.60	9.00	9.00	9.77
a 03	8.11	8.80	9.60	10.40	10.60	10.10	10.60	10.50	10.20	9.70	9.10	8.10	9.65
a 04	8.12	10.10	9.20	10.40	9.70	11.20	11.30	11.40	10.90	10.20	9.10	9.10	10.06
a 05	8.10	7.40	7.80	9.80	9.80	10.00	10.22	10.21	10.12	9.88	9.58	9.28	9.35
a 06	9.59	9.58	9.25	9.50	9.59	9.66	9.75	9.52	9.12	8.82	8.86	9.12	9.36
a 07	9.14	8.94	9.22	10.12	10.27	10.30	10.39	10.26	9.87	9.89	9.78	9.83	9.83
Mean	9.44	9.41	9.62	10.38	10.46	10.63	10.60	10.35	9.97	9.65	9.42	9.52	9.95

Authority, U.S. Lake Survey, except for supplied values.
a.—Deduced from the water records of the St. Lawrence canals furnished the International Waterways Commission.

TABLE 19.

DISCHARGE FROM LAKE SUPERIOR.

Monthly mean outflow from Lake Superior, through St. Marys River, in 100 cubic feet per second.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
1860	942	880	875	932	1018	1062	1062	1095	1057	1066	1025	932	994
61	875	813	780	870	1048	1087	1133	1126	1092	1098	1018	919	988
62	826	778	785	794	983	986	988	1029	1043	1027	949	875	922
63	820	785	746	750	813	799	840	986	976	937	854	817	844
64	739	686	702	702	771	810	840	845	866	806	760	714	770
65	661	654	624	721	866	965	1048	1068	1057	1009	884	801	863
66	723	670	670	769	859	907	983	1038	962	967	889	903	862
67	829	799	755	801	834	976	1062	1036	1041	1036	935	850	913
68	801	661	744	783	907	891	951	935	951	944	979	868	868
69	806	746	642	771	896	903	997	1105	1287	1168	1087	926	944
1870	856	804	806	824	932	893	946	949	974	937	893	668	874
71	744	707	644	677	808	903	944	926	937	891	840	750	814
72	693	674	619	610	815	854	946	1020	1036	1002	967	863	842
73	771	732	737	741	870	900	1002	1059	1075	1048	997	942	906
74	815	778	753	725	822	921	1006	1020	1016	1045	995	972	906
75	866	808	799	856	928	997	1016	1020	1085	1055	990	861	940
76	854	843	783	792	958	1092	1200	1211	1218	1142	1078	965	1011
77	898	905	877	850	850	900	976	1004	949	958	903	866	911
78	815	755	732	728	792	852	877	868	801	826	808	757	801
79	665	573	518	548	633	665	734	741	723	730	688	596	651
1880	550	543	522	525	695	870	926	898	935	882	889	824	755
81	753	730	734	709	806	859	905	886	930	1036	1013	937	858
82	820	769	741	730	824	845	926	949	935	914	900	838	849
83	739	718	718	734	732	817	859	956	880	845	820	760	798
84	737	693	672	633	718	741	792	801	817	838	861	801	759
85	762	737	704	665	799	877	919	969	914	873	856	787	822
86	707	670	670	665	776	813	852	884	852	859	843	744	778
87	693	661	654	622	704	808	893	866	834	875	822	728	763
88	691	612	624	622	760	956	992	990	972	969	923	778	824
89	722	664	670	668	780	816	870	872	870	840	780	704	771
1890	714	604	602	588	682	798	870	852	830	816	788	728	739
91	590	612	582	618	704	694	716	718	704	716	694	632	665
92	620	548	512	544	646	718	746	748	760	738	682	626	657
93	519	482	484	531	638	738	775	790	766	755	745	614	656
94	602	587	566	638	822	868	894	896	871	879	860	804	774
95	747	721	683	679	755	828	873	875	907	930	832	830	807
96	727	687	649	701	816	893	918	921	897	816	822	810	807
97	767	709	712	737	803	871	912	942	910	871	850	758	820
98	670	627	599	623	678	755	819	841	866	836	804	789	742
99	699	668	648	657	819	902	940	968	1004	942	926	917	841
1900	793	770	723	730	764	777	818	857	948	954	974	900	834
01	818	764	725	745	798	814	888	920	895	798	788	728	807
02	670	625	613	638	667	725	760	762	770	746	757	731	705
03	660	624	610	649	709	774	795	810	813	838	818	750	737
04	666	630	593	649	700	739	760	771	787	813	796	732	720
05	788	712	670	747	801	834	899	923	958	965	923	884	842
06	821	760	720	733	792	843	880	873	873	855	823	779	813
07	718	683	666	712	734	810	849	880	917	919	891	803	798
Mean	745	701	680	703	798	857	908	927	928	913	875	804	820

TABLE 20.
DISCHARGE FROM LAKE MICHIGAN-HURON.

Monthly mean outflow from Lake Michigan-Huron, through Detroit River, in 100 cubic feet per second.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
1860	2125	1447	1942	2051	2214	2326	2002	1995	1894	2376	1935	2250	2046
61	a2306	1723	2166	2290	2164	2274	2324	2409	2358	2299	2262	2264	2237
62	2053	1521	2024	2446	2358	2393	2370	2428	2411	2398	2362	2212	2248
63	2153	2040	1878	2122	2307	2204	2340	2336	2363	2202	2263	2187	2200
64	a2278	2043	2048	a2201	2309	2453	2376	2341	2310	2121	2162	2133	2231
65	1594	1446	1693	2092	2204	2241	2333	2340	2321	2276	2179	2087	2067
66	a2026	1928	1850	a1964	2098	2183	2268	2256	2243	2228	2295	2272	2134
67	1881	1996	1641	a2118	2299	2427	2381	2420	2337	2231	2154	2093	2165
68	a2042	1733	2179	2005	2209	2266	2211	2180	2146	2064	2016	1998	2095
69	1844	1692	1607	1976	1848	2030	2184	2211	2192	2091	2121	2133	1994
1870	a2021	1757	1853	2154	2212	2354	2456	2431	2373	2248	2248	2210	2193
71	2059	1679	a2257	2370	2429	2463	2466	2415	2319	2186	2174	2334	2263
72	1995	2032	1936	a1996	2100	2217	2059	2132	2126	2146	2024	2005	2064
73	1796	1924	2069	a1991	1997	2133	2195	2201	2202	2141	2134	2067	2071
74	1470	1053	1947	2053	1998	2106	2168	2164	2200	2185	2183	2027	1963
75	2008	2045	2093	2027	2187	2157	2218	2175	2140	2177	2158	1980	2114
76	2060	2160	a2188	2240	1955	2511	2627	2618	2389	2352	2300	a2283	2307
77	a2371	1947	1342	1753	1799	2251	2290	2277	2164	2232	1943	2149	2043
78	2054	1518	1566	2217	2231	2271	2316	2330	2178	2168	2088	1855	2066
79	1771	1482	1849	2062	1950	2078	2104	2052	2058	1961	1978	1956	1942
1880	1931	1709	1903	1974	1983	2176	2095	2216	2153	2089	2058	2054	2028
81	1756	1968	1891	2025	2083	2182	2178	2209	2247	2137	2288	2232	2100
82	2225	2045	2194	2182	2368	2206	2580	2615	2321	2271	2251	a2139	2283
83	a2238	2228	1856	2156	2230	2434	2754	2716	2538	2402	2307	2211	2339
84	1514	1703	2426	2428	2444	2541	2611	2489	2410	2367	2336	2384	2304
85	a2398	2352	a2364	a2287	2386	2445	2376	2432	2396	2217	2276	2204	2344
86	1677	1490	2008	2118	2428	2432	2418	2406	2403	2364	2298	2403	2204
87	2289	2253	1985	2133	2202	2261	2319	2316	2233	2217	2109	2016	2194
88	2090	2086	1922	2104	2036	2120	2208	2177	2186	2131	2079	1992	2094
89	2099	1701	1716	1792	1934	2100	2086	2097	2113	2020	1988	1817	1955
1890	1940	1797	1745	1823	1839	1964	2046	2066	1994	1919	1950	1875	1913
91	1718	1809	1534	1830	1865	1885	1931	1952	1943	1878	1912	1873	1844
92	1683	1425	1508	1767	1787	1864	1908	1926	1981	1905	1843	1753	1779
93	1464	1514	1851	1883	1817	1950	2047	2052	2034	1988	1990	1958	1879
94	1876	1698	1877	1867	1981	2045	2048	2051	2026	1971	1952	1882	1940
95	a1878	a1842	1988	1732	1814	1861	1898	1895	1868	1794	1722	1748	1837
96	1736	1410	1540	1681	1688	1791	1888	1898	1837	1842	1840	1683	1736
97	1925	a1784	1907	1849	1950	1871	1931	1932	1926	1898	1916	1807	1891
98	1756	1482	1888	1848	1818	1893	1986	1931	1964	1896	1969	1996	1869
99	1947	a1856	1366	1655	1812	1935	2022	2031	2015	1923	1883	1822	1856
1900	1736	1778	1874	1780	1796	1868	1932	1957	1978	1953	1974	1911	1878
01	1719	1410	1548	1161	1706	1986	2052	2084	2025	1983	1963	1935	1798
02	1522	1464	1827	1816	1818	1936	2054	2003	1944	1905	1846	1919	1838
03	1988	1851	1837	1879	1803	1911	1958	1978	1997	1999	1910	2138	1937
04	1612	1682	a1825	2035	1902	2031	2083	2103	2079	2035	1992	2019	1950
05	1580	1534	1676	1947	1922	2066	2118	2124	2094	2052	2004	1942	1922
06	1991	1548	1600	1905	1993	2034	2089	2082	2039	2021	1994	1895	1933
07	1779	1711	1749	1931	1962	1990	2075	2028	2047	2017	1961	1952	1934
Mean	1916	1756	1865	1996	2047	2148	2195	2197	2157	2110	2075	2043	2042

a.—St. Clair River discharge used.

SESSIONAL PAPER No. 54.

TABLE 21.
DISCHARGE FROM LAKE ERIE.

Monthly mean outflow from Lake Erie, through Niagara River, in 100 cubic feet per second.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
1860	2321	2178	2265	2423	2475	2486	2436	2375	2304	2244	2248	2256	2334
61	2161	2045	2136	2375	2485	2521	2474	2436	2431	2387	2410	2401	2357
62	2365	2237	2258	2471	2531	2551	2562	2439	2375	2294	2237	2291	2384
63	2372	2390	2361	2375	2418	2400	2387	2346	2264	2172	2101	2137	2311
64	2041	2025	2061	2157	2332	2337	2288	2203	2165	2105	2091	2153	2163
65	2022	1846	1904	2050	2183	2195	2203	2165	2171	2112	2050	2061	2080
66	1971	1887	1962	2077	2125	2206	2248	2169	2169	2181	2150	2197	2112
67	2098	1975	2055	2112	2234	2330	2298	2203	2123	2058	1970	1964	2118
68	1891	1765	1878	2048	2149	2261	2270	2125	2077	1987	1976	1973	2033
69	1941	1878	1973	2025	2149	2261	2348	2204	2251	2157	2075	2203	2130
1870	2229	2231	2164	2306	2356	2368	2395	2361	2314	2234	2188	2206	2279
71	2123	1997	2088	2185	2248	2273	2285	2215	2188	2045	2029	1973	2137
72	1925	1828	1798	1825	1917	2016	2029	2005	1966	1941	1893	1885	1919
73	1835	1792	1796	2061	2217	2255	2267	2231	2150	2094	2072	2206	2081
74	2269	2227	2221	2246	2267	2301	2327	2267	2170	2079	2009	2005	2199
75	1923	1840	1860	1929	2033	2149	2197	2176	2157	2056	2047	2143	2043
76	2102	2183	2332	2446	2528	2578	2567	2465	2435	2317	2365	2327	2387
77	2196	2105	2041	2124	2181	2217	2294	2239	2234	2152	2159	2225	2181
78	2213	2195	2213	2298	2356	2375	2393	2317	2298	2227	2206	2271	2280
79	2137	2055	2051	2118	2149	2187	2213	2140	2077	2038	1956	2059	2098
1880	2146	2103	2124	2145	2207	2251	2291	2213	2172	2081	2088	2055	2156
81	1931	1908	1968	2112	2205	2281	2286	2188	2119	2121	2105	2200	2119
82	2283	2229	2330	2367	2416	2474	2474	2416	2362	2265	2213	2135	2330
83	2084	2081	2115	2126	2234	2427	2500	2462	2397	2332	2265	2320	2279
84	2206	2215	2248	2370	2436	2475	2436	2375	2281	2215	2126	2155	2295
85	2081	1984	1941	2112	2286	2434	2441	2423	2400	2390	2387	2423	2275
86	2395	2159	2103	2298	2372	2416	2428	2357	2307	2267	2222	2246	2298
87	2161	2212	2383	2372	2472	2465	2423	2322	2244	2258	2125	2170	2297
88	2094	1954	1971	2121	2157	2197	2251	2225	2142	2098	2064	2133	2117
89	2091	2041	1952	2038	2075	2186	2196	2174	2084	1970	1970	2041	2068
1890	2178	2133	2191	2251	2342	2426	2354	2237	2152	2150	2196	2133	2229
91	2072	2046	2077	2106	2054	2050	2091	2025	1986	1903	1891	1897	2016
92	1878	1733	1775	1954	2054	2246	2299	2208	2143	2066	1978	1973	2026
93	1806	1796	1861	2006	2174	2258	2224	2086	2028	2006	2001	1993	2020
94	1993	1908	1931	1974	2088	2181	2150	2040	2002	2002	1962	1923	2013
95	1896	1749	1733	1777	1850	1872	1867	1838	1842	1792	1691	1744	1804
96	1775	1760	1687	1796	1891	1893	1932	1983	1891	1836	1842	1797	1840
97	1875	1781	1888	2004	2101	2097	2093	2066	1984	1886	1895	1921	1966
98	1893	1870	1951	2088	2119	2128	2077	2068	1981	1943	1965	1978	2005
99	1974	1875	1929	1973	2036	2079	2066	1983	1941	1850	1866	1954	1961
1900	1891	1878	1923	1999	2038	2056	2061	2034	1978	1893	1927	1912	1966
01	1876	1755	1712	1760	1786	1896	1936	1897	1908	1861	1831	1827	1837
02	1836	1706	1739	1855	1906	1975	2130	2110	2031	2053	1995	2009	1945
03	1961	1897	1992	2154	2159	2184	2194	2110	2088	2045	1966	1968	2060
04	1762	1813	1931	2170	2252	2317	2296	2225	2157	2103	2033	1993	2088
05	1906	1797	1816	1917	2049	2188	2264	2209	2161	2112	2029	2066	2043
06	2038	1936	1889	1977	2025	2075	2091	2078	2025	2020	2036	2066	2021
07	2185	2070	2014	2105	2157	2239	2276	2200	2148	2145	2126	2108	2148
Mean	2050	1981	2012	2116	2192	2251	2263	2203	2152	2095	2063	2085	2122

Discharge values include a flow of 1000 c.f.s. through Erie Canal, and one of 1100 c.f.s. through Welland Canal.

TABLE 22.

DISCHARGE FROM LAKE ONTARIO.

Monthly mean outflow from Lake Ontario, through St. Lawrence River, in 100 cubic feet per second.

YEAR	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
1860	2629	2661	2689	2699	2883	3062	3146	2960	2827	2767	2794	2676	2816
61	2587	2615	2754	2826	3267	3390	3313	3215	3072	3141	3147	2949	3023
62	2789	2656	2808	3103	3512	3404	3454	3280	3075	2900	2788	2642	3034
63	2689	2698	2725	2956	3218	3267	3128	2977	2850	2790	2732	2619	2887
64	2544	2496	2532	2698	3146	3246	3140	2989	2814	2740	2730	2652	2811
65	2778	2826	2873	2900	3079	3093	3040	2842	2659	2584	2501	2350	2794
66	2286	2288	2297	2432	2565	2543	2822	2791	2772	2720	2655	2505	2556
67	2438	2428	2642	2929	3278	3370	3243	3030	2866	2659	2445	2111	2787
68	1699	2049	2126	2309	2605	2725	2699	2609	2552	2370	2326	2266	2361
69	2223	2257	2322	2480	2794	3076	3091	3029	2862	2845	2717	2852	2712
1870	2748	²¹ 2040	²¹ 2760	3232	3505	3441	3432	3298	2795	2681	2898	2493	2944
71	2471	2419	2483	2658	2722	3131	2921	2857	2749	2722	2361	2132	2636
72	²¹ 2062	²¹ 1873	²¹ 1915	2114	2448	2453	2675	2665	2768	2366	2177	1978	2294
73	1967	1992	2019	2592	3016	3121	3183	2746	2613	2486	2447	2381	2547
74	2551	²¹ 2632	2849	2812	2933	2960	2945	3039	2662	2551	2377	2168	2707
75	²⁷ 1843	²⁷ 1579	²⁷ 1931	2435	2428	2440	2484	2478	2320	2329	2402	2253	2244
76	2229	²¹ 2478	²¹ 2583	2931	3041	3023	3112	3164	3042	2672	2926	2748	2829
77	²⁷ 2100	2337	²⁷ 2452	2706	2546	2560	2424	2594	2580	2586	2433	2245	2464
78	²⁷ 2273	²⁷ 2342	2493	2570	2370	2875	2930	2920	2816	2792	2786	2711	2656
79	²⁷ 2398	²¹ 2378	²¹ 2381	2550	2950	2882	2727	2884	2759	2724	2297	2346	2606
1880	2165	2424	2355	2513	2599	2696	2710	2597	2449	2276	2212	2152	2429
81	²⁷ 1726	²¹ 1723	²¹ 2230	2598	2641	2710	2699	2605	2278	2343	2313	2281	2346
82	²⁷ 2342	²¹ 2387	2553	2579	2975	2901	2970	2937	2946	2670	2566	2385	2684
83	²⁷ 1959	²⁴ 1872	²⁴ 2213	2411	2827	2892	3180	3141	3001	2886	2664	2662	2642
84	²⁴ 2184	²⁴ 2324	²⁷ 2724	3029	3248	3224	3153	2944	2963	2876	2657	2454	2815
85	²¹ 2270	²⁴ 2121	²⁴ 2197	2600	2771	2855	2920	2884	2792	2784	2877	2879	2662
86	²⁴ 2787	²¹ 2397	²¹ 2693	3159	3208	3172	3140	2928	2780	2829	2399	2614	2842
87	²¹ 2460	²⁷ 2650	²⁷ 2796	3075	3212	3074	3128	2942	2624	2458	2519	2449	2782
88	2225	²¹ 1996	²⁷ 2072	2555	2500	2523	2599	2615	2311	2475	2478	2366	2393
89	2408	²¹ 2207	²⁴ 2283	2594	2601	2678	2819	2754	2571	2666	2228	2264	2506
1890	²⁴ 2589	2614	²⁴ 2748	2890	3128	3020	3155	2643	2866	2816	2956	2591	2835
91	²⁷ 2404	²⁷ 2425	²⁴ 2649	3122	3033	2693	2530	2374	2382	2440	2299	2023	2531
92	²⁴ 2089	²¹ 1851	²¹ 1974	2392	2310	2549	2400	2436	2655	2387	2323	2304	2306
93	²¹ 1752	²⁷ 1915	²⁷ 2077	2353	3040	2994	2980	2826	2608	2519	2400	2339	2484
94	2297	²¹ 1990	²⁷ 2428	2673	2687	2793	2746	2600	2410	2319	2136	2206	2440
95	1989	²¹ 1659	²¹ 1774	2034	2197	2202	2134	2006	1866	1794	1710	1625	1916
96	²⁴ 1825	1932	²⁷ 1956	2230	2252	2306	2120	2088	1985	1924	1754	1648	2002
97	1890	²⁴ 1783	²¹ 1976	2022	2321	2198	2280	2290	2215	1972	2108	2120	2098
98	²¹ 2074	²⁷ 2143	2191	2580	2878	2898	2801	2501	2372	2327	2390	2069	2435
99	2078	²⁴ 2063	2190	2289	2644	2634	2603	2434	2266	2180	2135	2034	2296
1900	2022	²⁴ 2063	²¹ 1566	2365	2781	2575	2520	2530	2141	2135	2151	2226	2256
01	²⁷ 2131	1898	1893	2364	2442	2538	2496	2414	2305	2238	2152	2133	2250
02	²⁷ 1780	²⁷ 1522	²⁷ 2120	2227	2411	2434	2590	2573	2451	2337	2196	2265	2242
03	²¹ 1970	2049	2236	2746	2711	2681	2769	2673	2672	2289	2272	2176	2437
04	²⁴ 1973	1969	2048	2369	2675	2888	2767	2904	2726	2640	2508	2169	2470
05	²¹ 1968	²¹ 1779	²¹ 1886	2211	2449	2666	2668	2778	2671	2475	2536	2220	2359
06	²¹ 2403	2244	2191	2518	2589	2527	2606	2551	2464	2283	2249	2339	2414
07	²¹ 2266	²¹ 2207	²¹ 2291	2664	2741	2720	2742	2672	2590	2509	2467	2284	2513
Mean	2236	2193	2333	2606	2795	2835	2836	2750	2621	2526	2450	2341	2544

NOTE.—21, 24, and 27 indicate that St. Lawrence River discharges were derived from gage observations taken at Locks 21, 24, and 27, respectively.

SESSIONAL PAPER No. 54.

TABLE 24.

SUPPLY FACTORS OF LAKE SUPERIOR.

DATE.	WATER LEVELS OF—			STORAGE IN LAKE SUPERIOR.		OUTFLOW THROUGH ST. MARYS RIVER.		TOTAL SUPPLY TO LAKE SUPERIOR.	
	Lake Superior		St. Marys River.						
	Marquette, Mich. <i>a</i>		Sault Ste. Marie, Mich.						
	First of Month.	Mean of Month.	Mean of Month.	Ft. Depth.	100 c.f.s	100c.f.s	Ft. Depth, Lake Superior.	100 c.f.s.	Ft. Depth
1860									
Jan.		602.69	602.22			942	0.277		
Feb.	602.565	2.44	1.95	−0.135	− 459	880	0.259	421	0.124
Mar.	2.43	2.42	1.93	+0.125	+ 425	875	0.257	1300	0.382
April	2.555	2.69	2.18	+0.250	+ 850	932	0.274	1782	0.524
May	2.805	2.92	2.55	+0.200	+ 680	1018	0.299	1698	0.499
June	3.005	3.09	2.74	+0.065	+ 221	1062	0.312	1283	0.377
July	3.07	3.05	2.74	+0.005	+ 17	1062	0.312	1079	0.317
Aug.	3.075	3.10	2.80	+0.015	+ 51	1075	0.316	1126	0.331
Sept.	3.09	3.08	2.72	+0.010	+ 34	1057	0.311	1091	0.321
Oct.	3.10	3.12	2.76	−0.065	− 221	1066	0.313	845	0.248
Nov.	3.035	2.95	2.58	−0.260	− 884	1025	0.301	141	0.041
Dec.	2.775	2.60	2.18	−0.275	− 935	935	0.274	— 3	−0.001
1861									
Jan.	2.50	2.40	1.93	−0.225	− 765	875	0.257	110	−0.032
Feb.	2.275	2.15	1.66	−0.195	− 663	813	0.239	150	0.044
Mar.	2.08	2.01	1.52	+0.135	+ 459	780	0.229	1239	0.364
April	2.215	2.42	1.91	+0.520	+1768	870	0.256	2638	0.776
May	2.735	3.05	2.68	+0.390	+1326	1048	0.308	2374	0.698
June	3.125	3.20	2.85	+0.155	+ 527	1087	0.320	1614	0.475
July	3.28	3.36	3.05	+0.060	+ 204	1133	0.333	1337	0.393
Aug.	3.34	3.32	3.02	−0.065	− 221	1126	0.331	905	0.266
Sept.	3.275	3.23	2.87	−0.030	− 102	1092	0.321	990	0.291
Oct.	3.245	3.26	2.90	−0.155	− 527	1098	0.323	571	0.168
Nov.	3.09	2.92	2.55	−0.360	−1224	1018	0.299	— 206	−0.061
Dec.	2.73	2.54	2.12	−0.365	−1241	919	0.270	— 322	−0.095
1862									
Jan.	2.365	2.19	1.72	−0.270	− 918	826	0.243	— 92	−0.027
Feb.	2.095	2.00	1.51	−0.080	− 272	778	0.229	506	0.149
Mar.	2.015	2.03	1.54	+0.045	+ 153	785	0.231	938	0.276
April	2.06	2.09	1.58	+0.370	+1258	794	0.233	2052	0.603
May	2.43	2.77	2.40	+0.335	+1139	983	0.289	2122	0.624
June	2.765	2.76	2.41	−0.020	− 68	986	0.290	918	0.270
July	2.745	2.73	2.42	+0.070	+ 238	988	0.290	1226	0.360
Aug.	2.815	2.90	2.60	+0.145	+ 493	1029	0.303	1522	0.448
Sept.	2.96	3.02	2.66	+0.025	+ 85	1043	0.307	1128	0.332
Oct.	2.985	2.95	2.59	−0.200	− 680	1027	0.302	347	0.102
Nov.	2.785	2.62	2.25	−0.300	−1020	949	0.279	— 71	−0.021
Dec.	2.485	2.35	1.93	−0.230	− 782	875	0.257	93	0.027
1863									
Jan.	2.255	2.16	1.69	−0.160	− 544	820	0.241	276	0.081
Feb.	2.095	2.03	1.54	−0.150	− 510	785	0.231	275	0.081
Mar.	1.945	1.86	1.37	−0.065	− 221	746	0.219	525	0.154
April	1.88	1.90	1.39	+0.085	+ 289	750	0.221	1039	0.306
May	1.965	2.03	1.66	+0.025	+ 85	813	0.239	898	0.264
June	1.99	1.95	1.60	+0.030	+ 102	799	0.235	901	0.265
July	2.02	2.09	1.78	+0.380	+1292	840	0.247	2132	0.627
Aug.	2.40	2.71	2.41	+0.320	+1088	986	0.290	2074	0.610
Sept.	2.72	2.73	2.37	−0.075	− 255	976	0.287	721	0.212
Oct.	2.645	2.56	2.20	−0.260	− 884	937	0.276	53	0.016
Nov.	2.385	2.21	1.84	−0.230	− 782	854	0.251	72	0.021
Dec.	2.155	2.10	1.68	−0.200	− 680	817	0.240	137	0.040

a.—Water Levels taken at Superior, Wis., from 1860 to 1871, inclusive.

TABLE 24.—Continued.

SUPPLY FACTORS OF LAKE SUPERIOR.

DATE.	WATER LEVELS OF—			STORAGE IN LAKE SUPERIOR.		OUTFLOW THROUGH ST. MARYS RIVER.		TOTAL SUPPLY TO LAKE SUPERIOR.	
	Lake Superior		St. Marys River.						
	Marquette, Mich. <i>a</i>		Sault Ste. Marie, Mich.						
	First of Month.	Mean of Month.	Mean of Month.	Ft. Depth.	100 c.f.s	100c.f.s	Ft. Depth, Lake Superior.	100 c.f.s.	Ft. Depth
1864									
Jan.	601.955	601.81	601.34	−0.250	− 850	739	0.217	− 111	−0.033
Feb.	1.705	1.60	1.11	−0.070	− 238	686	0.202	448	0.132
Mar.	1.635	1.67	1.18	+0.045	+ 153	702	0.206	855	0.251
April	1.68	1.69	1.18	+0.090	+ 306	702	0.206	1008	0.296
May	1.77	1.85	1.48	+0.155	+ 527	771	0.227	1298	0.382
June	1.925	2.00	1.65	+0.120	+ 408	810	0.238	1218	0.358
July	2.045	2.09	1.78	+0.050	+ 170	840	0.247	1010	0.297
Aug.	2.095	2.10	1.80	+0.080	+ 272	845	0.248	1117	0.328
Sept.	2.175	2.25	1.89	−0.055	− 187	866	0.255	679	0.200
Oct.	2.12	1.99	1.63	−0.225	− 765	806	0.237	41	0.012
Nov.	1.895	1.80	1.43	−0.170	− 578	760	0.223	182	0.053
Dec.	1.725	1.65	1.23	−0.165	− 561	714	0.210	153	0.045
1865									
Jan.	1.56	1.47	1.00	−0.095	− 323	661	0.194	338	0.099
Feb.	1.465	1.46	0.97	−0.070	− 238	654	0.192	416	0.122
Mar.	1.395	1.33	0.84	+0.155	+ 527	624	0.183	1151	0.338
April	1.55	1.77	1.26	+0.465	+1582	721	0.212	2303	0.677
May	2.015	2.26	1.89	+0.450	+1530	866	0.255	2396	0.705
June	2.465	2.67	2.32	+0.365	+1241	965	0.284	2206	0.649
July	2.83	2.99	2.68	+0.200	+ 680	1048	0.308	1728	0.508
Aug.	3.03	3.07	2.77	+0.045	+ 153	1068	0.314	1221	0.359
Sept.	3.075	3.08	2.72	−0.100	− 340	1057	0.311	717	0.211
Oct.	2.975	2.87	2.51	−0.370	−1258	1009	0.297	− 249	−0.073
Nov.	2.605	2.34	1.97	−0.420	−1428	884	0.260	− 544	−0.160
Dec.	2.185	2.03	1.61	−0.300	−1020	801	0.236	− 219	−0.064
1866									
Jan.	1.885	1.74	1.27	−0.250	− 850	723	0.213	− 127	−0.037
Feb.	1.635	1.53	1.04	−0.105	− 357	670	0.197	313	0.092
Mar.	1.53	1.53	1.04	+0.225	+ 765	670	0.197	1435	0.422
April	1.755	1.98	1.47	+0.350	+1190	769	0.226	1959	0.576
May	2.105	2.23	1.86	+0.220	+ 748	859	0.253	1607	0.473
June	2.325	2.42	2.07	+0.240	+ 816	907	0.267	1723	0.507
July	2.565	2.71	2.40	+0.260	+ 884	983	0.289	1867	0.549
Aug.	2.825	2.94	2.64	−0.020	− 68	1038	0.305	970	0.285
Sept.	2.805	2.67	2.31	−0.125	− 425	962	0.283	537	0.158
Oct.	2.68	2.69	2.33	−0.155	− 527	967	0.284	440	0.129
Nov.	2.525	2.36	1.99	−0.110	− 374	889	0.261	515	0.151
Dec.	2.415	2.47	2.05	−0.080	− 272	903	0.266	631	0.186
1867									
Jan.	2.335	2.20	1.73	−0.190	− 646	829	0.244	183	0.054
Feb.	2.145	2.09	1.60	−0.150	− 510	799	0.235	289	0.085
Mar.	1.995	1.90	1.41	+0.015	+ 51	755	0.222	806	0.237
April	2.01	2.12	1.61	+0.050	+ 170	801	0.236	971	0.286
May	2.06	2.12	1.75	+0.350	+1190	834	0.245	2024	0.595
June	2.41	2.72	2.37	+0.475	+1616	976	0.287	2592	0.762
July	2.885	3.05	2.74	+0.105	+ 357	1062	0.312	1419	0.417
Aug.	2.99	2.93	2.63	−0.020	− 68	1036	0.305	968	0.285
Sept.	2.97	3.01	2.65	+0.030	+ 102	1041	0.306	1143	0.336
Oct.	3.00	2.99	2.63	−0.225	− 765	1036	0.305	271	0.080
Nov.	2.775	2.56	2.19	−0.375	−1275	935	0.275	− 340	−0.100
Dec.	2.40	2.24	1.82	−0.240	− 816	850	0.250	34	0.010

a.—Water Levels taken at Superior, Wis., from 1860 to 1871, inclusive.

SESSIONAL PAPER No. 54.

TABLE 24.—Continued.

SUPPLY FACTORS OF LAKE SUPERIOR.

DATE.	WATER LEVELS OF—			STORAGE IN LAKE SUPERIOR.		OUTFLOW THROUGH ST. MARYS RIVER.		TOTAL SUPPLY TO LAKE SUPERIOR.	
	Lake Superior		St. Marys River.						
	Marquette, Mich. <i>a</i>		Sault Ste. Marie, Mich.						
	First of Month.	Mean of Month.	Mean of Month.	Ft. Depth.	100 c.f.s	100c.f.s	Ft. Depth. Lake Superior.	100 c.f.s.	Ft. Depth
1868									
Jan.	602.16	602.08	601.61	−0.375	−1275	801	0.236	− 474	−0.139
Feb.	1.785	1.49	1.00	−0.115	− 391	661	0.194	270	0.079
Mar.	1.67	1.85	1.36	+0.265	+ 901	744	0.219	1645	0.484
April	1.945	2.04	1.53	+0.295	+1003	783	0.230	1786	0.525
May	2.24	2.44	2.07	+0.155	+ 527	907	0.267	1434	0.422
June	2.395	2.35	2.00	+0.065	+ 221	891	0.262	1112	0.327
July	2.46	2.57	2.26	+0.070	+ 238	951	0.280	1189	0.350
Aug.	2.53	2.49	2.19	+0.025	+ 85	935	0.275	1020	0.300
Sept.	2.555	2.62	2.26	+0.050	+ 170	951	0.280	1121	0.330
Oct.	2.605	2.59	2.23	+0.065	+ 221	944	0.278	1165	0.343
Nov.	2.67	2.75	2.39	−0.135	− 459	979	0.288	520	0.153
Dec.	2.535	2.32	1.90	−0.325	−1105	868	0.255	− 237	−0.070
1869									
Jan.	2.21	2.10	1.63	−0.230	− 782	806	0.237	24	0.007
Feb.	1.98	1.86	1.37	−0.345	−1173	746	0.219	− 427	−0.126
Mar.	1.635	1.41	0.92	+0.065	+ 221	642	0.189	863	0.254
April	1.70	1.99	1.48	+0.490	+1666	771	0.227	2436	0.716
May	2.19	2.39	2.02	+0.205	+ 697	896	0.263	1593	0.468
June	2.395	2.40	2.05	+0.190	+ 646	903	0.266	1549	0.456
July	2.585	2.77	2.46	+0.415	+1411	997	0.293	2408	0.708
Aug.	3.00	3.23	2.93	+0.655	+2228	1105	0.325	3333	0.980
Sept.	3.655	4.08	3.72	+0.165	+ 561	1287	0.378	1848	0.543
Oct.	3.82	3.56	3.20	−0.430	−1462	1168	0.343	− 294	−0.086
Nov.	3.39	3.22	2.85	−0.495	−1684	1087	0.320	− 597	−0.176
Dec.	2.895	2.57	2.15	−0.450	−1530	926	0.272	− 604	−0.178
1870									
Jan.	2.445	2.32	1.85	−0.230	− 782	856	0.252	74	0.022
Feb.	2.215	2.11	1.62	−0.100	− 340	804	0.236	464	0.136
Mar.	2.115	2.12	1.63	+0.055	+ 187	806	0.237	993	0.292
April	2.17	2.22	1.71	+0.215	+ 731	824	0.242	1555	0.457
May	2.385	2.55	2.18	+0.070	+ 238	932	0.274	1170	0.344
June	2.455	2.36	2.01	0.000	0	893	0.263	893	0.263
July	2.455	2.55	2.24	+0.095	+ 323	946	0.278	1269	0.373
Aug.	2.55	2.55	2.25	+0.085	+ 289	949	0.279	1238	0.364
Sept.	2.635	2.72	2.36	+0.005	+ 17	974	0.286	991	0.291
Oct.	2.64	2.56	2.20	−0.170	− 578	937	0.276	359	0.106
Nov.	2.47	2.38	2.01	−0.555	−1888	893	0.263	− 995	−0.293
Dec.	1.915	1.45	1.03	−0.510	−1734	668	0.196	−1066	−0.313
1871									
Jan.	1.405	1.36	1.36	−0.345	−1173	744	0.219	− 429	−0.126
Feb.	1.06	0.76	1.20	+0.410	+1394	707	0.208	2101	0.618
Mar.	1.47	1.18	0.93	−0.040	− 136	644	0.189	508	0.149
April	1.43	1.68	1.07	+0.515	+1752	677	0.199	2429	0.714
May	1.945	2.21	1.64	+0.325	+1105	808	0.238	1913	0.562
June	2.27	2.33	2.05	+0.095	+ 323	903	0.266	1226	0.360
July	2.365	2.40	2.23	+0.065	+ 221	944	0.278	1165	0.343
Aug.	2.43	2.46	2.15	+0.080	+ 272	926	0.272	1198	0.352
Sept.	2.51	2.56	2.20	+0.015	+ 51	937	0.276	988	0.291
Oct.	2.525	2.49	2.00	−0.070	− 238	891	0.262	653	0.192
Nov.	2.455	2.42	1.78	−0.405	−1377	840	0.247	− 537	−0.158
Dec.	2.05	1.68	1.39	−0.475	−1616	750	0.221	− 866	−0.255

a.—Water Levels taken at Superior, Wis., from 1860 to 1871, inclusive.

TABLE 24.—Continued.

SUPPLY FACTORS OF LAKE SUPERIOR.

DATE.	WATER LEVELS OF—			STORAGE IN LAKE SUPERIOR.		OUTFLOW THROUGH ST. MARYS RIVER.		TOTAL SUPPLY TO LAKE SUPERIOR.	
	Lake Superior		St. Marys River.						
	Marquette, Mich. a		Sault Ste. Marie, Mich.						
	First of Month.	Mean of Month.	Mean of Month.	Ft. Depth.	100 c.f.s	100c.f.s	Ft. Depth, Lake Superior.	100 c.f.s.	Ft. Depth
1872									
Jan.	601.575	601.47	601.14	−0.160	− 544	693	0.204	149	0.044
Feb.	1.415	1.36	1.06	−0.115	− 391	674	0.198	283	0.083
Mar.	1.30	1.24	0.82	−0.110	− 374	619	0.182	245	0.072
April	1.19	1.14	0.78	+0.275	+ 935	610	0.179	1545	0.454
May	1.465	1.79	1.67	+0.515	+1752	815	0.240	2567	0.755
June	1.98	2.17	1.84	+0.325	+1105	854	0.251	1959	0.576
July	2.305	2.44	2.24	+0.220	+ 748	946	0.278	1694	0.498
Aug.	2.525	2.61	2.56	+0.165	+ 561	1020	0.300	1581	0.465
Sept.	2.69	2.77	2.63	+0.030	+ 102	1036	0.305	1138	0.335
Oct.	2.72	2.67	2.48	−0.125	− 425	1002	0.295	577	0.170
Nov.	2.595	2.52	2.33	−0.225	− 765	967	0.284	202	0.059
Dec.	2.37	2.22	1.88	−0.200	− 680	863	0.254	183	0.054
1873									
Jan.	2.17	2.12	1.48	−0.210	− 714	771	0.227	57	0.017
Feb.	1.96	1.80	1.31	−0.150	− 510	732	0.215	222	0.065
Mar.	1.81	1.82	1.33	+0.030	+ 102	737	0.217	839	0.247
April	1.84	1.86	1.35	+0.245	+ 833	741	0.218	1574	0.463
May	2.085	2.31	1.91	+0.375	+1275	870	0.256	2145	0.631
June	2.46	2.61	2.04	+0.295	+1003	900	0.265	1903	0.560
July	2.755	2.90	2.48	+0.235	+ 799	1002	0.295	1801	0.530
Aug.	2.99	3.08	2.73	+0.120	+ 408	1059	0.311	1467	0.431
Sept.	3.11	3.14	2.80	−0.020	− 68	1075	0.316	1007	0.296
Oct.	3.09	3.04	2.68	−0.120	− 408	1048	0.308	640	0.188
Nov.	2.97	2.90	2.46	−0.220	− 748	997	0.293	249	0.073
Dec.	2.75	2.60	2.22	−0.380	−1292	942	0.277	− 350	−0.103
1874									
Jan.	2.37	2.14	1.67	−0.235	− 799	815	0.240	16	0.005
Feb.	2.135	2.13	1.51	−0.025	− 85	778	0.229	693	0.204
Mar.	2.11	2.09	1.40	+0.030	+ 102	753	0.221	855	0.252
April	2.14	2.19	1.28	+0.085	+ 289	725	0.213	1014	0.298
May	2.225	2.26	1.70	+0.135	+ 459	822	0.242	1281	0.377
June	2.36	2.46	2.13	+0.290	+ 986	921	0.271	1907	0.561
July	2.65	2.84	2.50	+0.235	+ 799	1006	0.296	1805	0.531
Aug.	2.885	2.93	2.56	+0.095	+ 323	1020	0.300	1343	0.395
Sept.	2.98	3.03	2.54	+0.080	+ 272	1016	0.299	1288	0.379
Oct.	3.06	3.09	2.67	−0.060	− 204	1045	0.307	841	0.247
Nov.	3.00	2.91	2.45	−0.245	− 833	995	0.293	162	0.048
Dec.	2.755	2.60	2.35	−0.315	−1071	972	0.286	− 99	−0.029
1875									
Jan.	2.44	2.28	1.89	−0.180	− 612	866	0.255	254	0.075
Feb.	2.26	2.24	1.64	0.000	0	808	0.238	808	0.238
Mar.	2.26	2.28	1.60	+0.020	+ 68	799	0.235	867	0.255
April	2.28	2.28	1.85	+0.110	+ 374	856	0.252	1230	0.362
May	2.39	2.50	2.16	+0.290	+ 986	928	0.273	1914	0.563
June	2.68	2.86	2.46	+0.175	+ 595	997	0.293	1593	0.468
July	2.855	2.85	2.54	+0.040	+ 136	1016	0.299	1152	0.339
Aug.	2.895	2.94	2.56	+0.160	+ 544	1020	0.300	1564	0.460
Sept.	3.055	3.17	2.84	+0.040	+ 136	1085	0.319	1221	0.359
Oct.	3.095	3.02	2.71	−0.145	− 493	1055	0.310	562	0.165
Nov.	2.95	2.88	2.43	−0.170	− 578	990	0.291	412	0.121
Dec.	2.78	2.68	1.87	−0.200	− 680	861	0.253	181	0.053

SESSIONAL PAPER No. 54.

TABLE 24.—Continued.

SUPPLY FACTORS OF LAKE SUPERIOR.

DATE.	WATER LEVELS OF—			STORAGE IN LAKE SUPERIOR.		OUTFLOW THROUGH ST. MARYS RIVER.		TOTAL SUPPLY TO LAKE SUPERIOR.	
	Lake Superior		St. Marys River.						
	Marquette, Mich. a		Sault Ste. Marie, Mich.						
	First of Month.	Mean of Month.	Mean of Month.	Ft. Depth.	100 c.f.s	100c.f.s	Ft. Depth, Lake Superior.	100 c.f.s.	Ft. Depth
1876									
Jan.	602.58	602.48	601.84	−0.205	− 697	854	0.251	157	0.046
Feb.	2.375	2.27	1.79	−0.150	− 510	843	0.248	333	0.098
Mar.	2.225	2.18	1.53	−0.030	− 102	783	0.230	681	0.200
April	2.195	2.21	1.57	+0.285	+ 969	792	0.233	1761	0.518
May	2.48	2.75	2.29	+0.610	+2075	958	0.282	3033	0.892
June	3.09	3.43	2.87	+0.535	+1820	1092	0.321	2912	0.856
July	3.625	3.82	3.34	+0.250	+ 850	1200	0.353	2050	0.603
Aug.	3.875	3.93	3.39	0.000	0	1211	0.356	1211	0.356
Sept.	3.875	3.82	3.42	−0.220	− 748	1218	0.358	470	0.138
Oct.	3.655	3.49	3.09	−0.245	− 833	1142	0.336	309	0.091
Nov.	3.41	3.33	2.81	−0.220	− 748	1078	0.317	330	0.097
Dec.	3.19	3.05	2.32	−0.320	−1088	965	0.284	− 123	−0.036
1877									
Jan.	2.87	2.69	2.03	−0.300	−1020	898	0.264	− 122	−0.036
Feb.	2.57	2.45	2.06	−0.250	− 850	905	0.266	55	0.016
Mar.	2.32	2.19	1.94	−0.170	− 578	877	0.258	299	0.088
April	2.15	2.11	1.82	−0.045	− 153	850	0.250	697	0.205
May	2.105	2.10	1.82	+0.105	+ 357	850	0.250	1207	0.355
June	2.21	2.32	2.04	+0.300	+1020	900	0.265	1920	0.565
July	2.51	2.70	2.37	+0.220	+ 748	976	0.287	1724	0.507
Aug.	2.73	2.76	2.49	−0.050	− 170	1004	0.295	834	0.245
Sept.	2.68	2.60	2.25	−0.080	− 272	949	0.279	677	0.199
Oct.	2.60	2.60	2.29	−0.105	− 357	958	0.282	601	0.177
Nov.	2.495	2.39	2.05	−0.140	− 476	903	0.266	427	0.126
Dec.	2.355	2.32	1.89	−0.095	− 323	866	0.255	543	0.160
1878									
Jan.	2.26	2.20	1.67	0.000	0	815	0.240	815	0.240
Feb.	2.26	2.32	1.41	−0.325	−1105	755	0.222	− 350	−0.103
Mar.	1.935	1.55	1.31	−0.400	−1360	732	0.215	− 628	−0.185
April	1.535	1.52	1.29	+0.120	+ 408	728	0.214	1136	0.334
May	1.655	1.79	1.57	+0.275	+ 935	792	0.233	1727	0.508
June	1.93	2.07	1.83	+0.175	+ 595	852	0.251	1447	0.425
July	2.105	2.14	1.94	−0.025	− 85	877	0.258	792	0.233
Aug.	2.08	2.02	1.90	−0.145	− 493	868	0.255	375	0.110
Sept.	1.935	1.85	1.61	−0.050	− 170	801	0.236	631	0.186
Oct.	1.885	1.92	1.72	−0.065	− 221	826	0.243	605	0.178
Nov.	1.82	1.72	1.64	−0.260	− 884	808	0.238	− 76	−0.022
Dec.	1.56	1.40	1.42	−0.115	− 391	757	0.223	366	0.108
1879									
Jan.	1.445	1.49	1.02	+0.030	+ 102	665	0.196	767	0.226
Feb.	1.475	1.46	0.62	+0.135	+ 459	573	0.168	1032	0.303
Mar.	1.61	1.76	0.38	−0.045	− 153	518	0.152	365	0.107
April	1.565	1.37	0.51	−0.375	−1275	548	0.161	− 727	−0.214
May	1.19	1.01	0.88	−0.065	− 221	633	0.186	412	0.121
June	1.125	1.24	1.02	+0.235	+ 799	665	0.196	1464	0.431
July	1.36	1.48	1.32	+0.180	+ 612	734	0.216	1346	0.396
Aug.	1.54	1.60	1.35	+0.005	+ 17	741	0.218	758	0.223
Sept.	1.545	1.49	1.27	−0.010	− 34	723	0.213	689	0.203
Oct.	1.535	1.58	1.30	+0.005	+ 17	730	0.215	747	0.220
Nov.	1.54	1.50	1.12	−0.220	− 748	688	0.202	− 60	−0.018
Dec.	1.32	1.14	0.72	−0.255	− 867	596	0.175	− 271	−0.080

TABLE 24.—Continued.

SUPPLY FACTORS OF LAKE SUPERIOR.

DATE.	WATER LEVELS OF—			STORAGE IN LAKE SUPERIOR.		OUTFLOW THROUGH ST. MARYS RIVER.		TOTAL SUPPLY TO LAKE SUPERIOR.	
	Lake Superior		St. Marys River.						
	Marquette, Mich. <i>a</i>		Sault Ste. Marie, Mich.						
	First of Month.	Mean of Month.	Mean of Month.	Ft. Depth.	100 c.f.s	100c.f.s	Ft. Depth, Lake Superior.	100 c.f.s.	Ft. Depth
1880									
Jan.	601.065	600.99	600.52	−0.080	− 272	550	0.162	278	0.082
Feb.	0.985	0.98	0.49	−0.050	− 170	543	0.160	373	0.110
Mar.	0.935	0.89	0.40	+0.470	+1598	522	0.153	2120	0.623
April	1.405	1.92	0.41	+0.315	+1071	525	0.154	1596	0.469
May	1.72	1.52	1.15	+0.190	+ 646	695	0.204	1341	0.394
June	1.91	2.30	1.91	+0.465	+1582	870	0.256	2452	0.721
July	2.375	2.45	2.15	+0.070	+ 238	926	0.272	1164	0.342
Aug.	2.445	2.44	2.03	−0.005	− 17	898	0.264	881	0.259
Sept.	2.44	2.44	2.19	−0.025	− 85	935	0.275	850	0.250
Oct.	2.415	2.39	1.96	−0.055	− 187	882	0.259	695	0.204
Nov.	2.36	2.33	1.99	−0.160	− 544	889	0.261	345	0.101
Dec.	2.20	2.07	1.71	−0.260	− 884	824	0.242	− 60	−0.018
1881									
Jan.	1.94	1.81	1.40	−0.180	− 612	753	0.221	141	0.041
Feb.	1.76	1.71	1.30	−0.095	− 323	730	0.215	407	0.120
Mar.	1.665	1.62	1.32	−0.090	− 306	734	0.216	428	0.126
April	1.575	1.53	1.21	+0.105	+ 357	709	0.208	1066	0.313
May	1.68	1.83	1.63	+0.370	+1258	806	0.237	2064	0.607
June	2.05	2.27	1.86	+0.250	+ 850	859	0.253	1709	0.503
July	2.30	2.33	2.06	+0.055	+ 187	905	0.266	1092	0.321
Aug.	2.355	2.38	1.98	+0.140	+ 476	886	0.260	1362	0.400
Sept.	2.495	2.61	2.17	+0.285	+ 969	930	0.273	1899	0.558
Oct.	2.78	2.95	2.63	+0.135	+ 459	1036	0.305	1495	0.440
Nov.	2.915	2.88	2.53	−0.175	− 595	1013	0.298	418	0.123
Dec.	2.74	2.60	2.20	−0.315	−1071	937	0.276	− 134	−0.039
1882									
Jan.	2.425	2.25	1.69	−0.300	−1020	820	0.241	− 200	−0.059
Feb.	2.125	2.00	1.47	−0.180	− 612	769	0.226	157	0.046
Mar.	1.945	1.89	1.35	−0.095	− 323	741	0.218	418	0.123
April	1.85	1.81	1.30	+0.040	+ 136	730	0.215	866	0.255
May	1.89	1.97	1.71	+0.090	+ 306	824	0.242	1130	0.332
June	1.98	1.99	1.80	+0.235	+ 799	845	0.248	1644	0.483
July	2.215	2.44	2.15	+0.285	+ 969	926	0.272	1895	0.557
Aug.	2.50	2.56	2.25	+0.080	+ 272	949	0.279	1221	0.359
Sept.	2.58	2.60	2.19	−0.065	− 221	935	0.275	714	0.210
Oct.	2.515	2.43	2.10	−0.095	− 323	914	0.269	591	0.174
Nov.	2.42	2.41	2.04	−0.105	− 357	900	0.265	543	0.160
Dec.	2.315	2.22	1.77	−0.210	− 714	838	0.246	124	0.036
1883									
Jan.	2.105	1.99	1.34	−0.260	− 884	739	0.217	− 145	−0.043
Feb.	1.845	1.70	1.25	−0.145	− 493	718	0.211	225	0.066
Mar.	1.70	1.70	1.25	+0.125	+ 425	718	0.211	1143	0.336
April	1.825	1.95	1.32	+0.130	+ 442	734	0.216	1176	0.346
May	1.955	1.96	1.31	+0.055	+ 187	732	0.215	919	0.270
June	2.01	2.06	1.68	+0.175	+ 595	817	0.240	1412	0.415
July	2.185	2.31	1.86	+0.135	+ 459	859	0.253	1318	0.388
Aug.	2.32	2.33	2.28	−0.010	− 34	956	0.281	922	0.271
Sept.	2.31	2.29	1.95	−0.120	− 408	880	0.259	472	0.139
Oct.	2.19	2.09	1.80	−0.175	− 595	845	0.248	250	0.073
Nov.	2.015	1.94	1.69	−0.130	− 442	820	0.241	378	0.111
Dec.	1.885	1.83	1.43	−0.070	− 238	760	0.223	522	0.153

SESSIONAL PAPER No. 54.

TABLE 24.—Continued.

SUPPLY FACTORS OF LAKE SUPERIOR.

DATE.	WATER LEVELS OF—			STORAGE IN LAKE SUPERIOR.		OUTFLOW THROUGH ST. MARYS RIVER.		TOTAL SUPPLY TO LAKE SUPERIOR.	
	Lake Superior		St. Marys River.						
	Marquette, Mich. <i>a</i>		Sault Ste. Marie, Mich.						
	First of Month.	Mean of Month.	Mean of Month.	Ft. Depth.	100 c.f.s	100c.f.s	Ft. Depth, Lake Superior.	100 c.f.s.	Ft. Depth
1884									
Jan.	601.815	601.80	601.33	−0.100	− 340	737	0.217	397	0.117
Feb.	1.715	1.63	1.14	−0.130	− 442	693	0.204	251	0.074
Mar.	1.585	1.54	1.05	−0.155	− 527	672	0.198	145	0.043
April	1.43	1.32	0.88	0.000	0	633	0.186	633	0.186
May	1.43	1.54	1.25	+0.210	+ 714	718	0.211	1432	0.421
June	1.64	1.74	1.35	+0.170	+ 578	741	0.218	1319	0.388
July	1.81	1.88	1.57	+0.075	+ 255	792	0.233	1047	0.308
Aug.	1.885	1.89	1.61	+0.140	+ 476	801	0.236	1277	0.375
Sept.	2.025	2.16	1.68	+0.315	+1071	817	0.240	1888	0.555
Oct.	2.34	2.52	1.77	+0.130	+ 442	838	0.246	1280	0.376
Nov.	2.47	2.42	1.87	−0.155	− 527	861	0.253	334	0.098
Dec.	2.315	2.21	1.61	−0.220	− 748	801	0.236	53	0.016
1885									
Jan.	2.095	1.98	1.44	−0.205	− 697	762	0.224	65	0.019
Feb.	1.89	1.80	1.33	−0.130	− 442	737	0.217	295	0.087
Mar.	1.76	1.72	1.19	−0.065	− 221	704	0.207	483	0.142
April	1.695	1.67	1.02	+0.140	+ 476	665	0.196	1141	0.336
May	1.835	2.00	1.60	+0.305	+1037	799	0.235	1836	0.540
June	2.14	2.28	1.94	+0.260	+ 884	877	0.258	1761	0.518
July	2.40	2.52	2.12	+0.180	+ 612	919	0.270	1531	0.450
Aug.	2.58	2.64	2.34	+0.025	+ 85	969	0.285	1054	0.310
Sept.	2.605	2.57	2.10	−0.120	− 408	914	0.269	506	0.149
Oct.	2.485	2.40	1.92	−0.160	− 544	873	0.257	329	0.097
Nov.	2.325	2.25	1.85	−0.240	− 816	856	0.252	40	0.012
Dec.	2.085	1.92	1.55	−0.265	− 901	787	0.231	− 114	−0.034
1886									
Jan.	1.82	1.72	1.20	−0.165	− 561	707	0.208	146	0.043
Feb.	1.655	1.59	1.04	−0.095	− 323	670	0.197	347	0.102
Mar.	1.56	1.53	1.04	+0.015	+ 51	670	0.197	721	0.212
April	1.575	1.62	1.02	+0.170	+ 578	665	0.196	1243	0.365
May	1.745	1.87	1.50	+0.195	+ 663	776	0.228	1439	0.423
June	1.94	2.01	1.66	+0.105	+ 357	813	0.239	1170	0.344
July	2.045	2.08	1.83	−0.010	− 34	852	0.251	818	0.241
Aug.	2.035	1.99	1.97	−0.055	− 187	884	0.260	697	0.205
Sept.	1.98	1.97	1.83	+0.040	+ 136	852	0.251	988	0.291
Oct.	2.02	2.07	1.86	−0.025	− 85	859	0.253	774	0.228
Nov.	1.995	1.92	1.79	−0.145	− 493	843	0.248	350	0.103
Dec.	1.85	1.78	1.36	−0.225	− 765	744	0.219	− 21	−0.006
1887									
Jan.	1.625	1.47	1.14	−0.145	− 493	693	0.204	200	0.059
Feb.	1.48	1.49	1.00	+0.165	+ 561	661	0.194	1222	0.359
Mar.	1.645	1.80	0.97	+0.240	+ 816	654	0.192	1470	0.432
April	1.885	1.97	0.83	−0.020	− 68	622	0.183	554	0.163
May	1.865	1.76	1.19	−0.025	− 85	704	0.207	619	0.182
June	1.84	1.92	1.64	+0.220	+ 748	808	0.238	1556	0.458
July	2.06	2.20	2.01	+0.180	+ 612	893	0.263	1505	0.443
Aug.	2.24	2.28	1.89	−0.030	− 102	866	0.255	764	0.225
Sept.	2.21	2.14	1.75	−0.105	− 357	834	0.245	477	0.140
Oct.	2.105	2.07	1.93	−0.155	− 527	875	0.257	348	0.102
Nov.	1.95	1.83	1.70	−0.230	− 782	822	0.242	40	0.012
Dec.	1.72	1.61	1.29	−0.165	− 561	728	0.214	167	0.049

TABLE 24.—Continued.

SUPPLY FACTORS OF LAKE SUPERIOR.

DATE.	WATER LEVELS OF—			STORAGE IN LAKE SUPERIOR.		OUTFLOW THROUGH ST. MARYS RIVER.		TOTAL SUPPLY TO LAKE SUPERIOR.	
	Lake Superior		St. Marys River.						
	Marquette, Mich. <i>a</i>		Sault Ste. Marie, Mich.						
	First of Month.	Mean of Month.	Mean of Month.	Ft. Depth.	100 c.f.s	100c.f.s	Ft. Depth, Lake Superior.	100 c.f.s.	Ft. Depth
1888									
Jan.	601.555	601.50	601.13	−0.050	− 170	691	0.203	521	0.153
Feb.	1.505	1.51	0.79	−0.030	− 102	612	0.180	510	0.150
Mar.	1.475	1.44	0.84	−0.035	− 119	624	0.183	505	0.148
April	1.44	1.44	0.83	+0.235	+ 799	622	0.183	1421	0.418
May	1.675	1.91	1.43	+0.625	+2126	760	0.223	2886	0.849
June	2.30	2.69	2.28	+0.485	+1650	956	0.281	2606	0.766
July	2.785	2.88	2.44	+0.165	+ 561	992	0.292	1553	0.457
Aug.	2.95	3.02	2.43	+0.045	+ 153	990	0.291	1143	0.336
Sept.	2.995	2.97	2.35	−0.070	− 238	972	0.286	734	0.216
Oct.	2.925	2.88	2.34	−0.115	− 391	969	0.285	578	0.170
Nov.	2.81	2.74	2.14	−0.245	− 833	923	0.271	90	0.026
Dec.	2.565	2.39	1.80	−0.335	−1139	778	0.229	− 361	−0.106
1889									
Jan.	2.23	2.07	1.52	−0.270	− 918	722	0.212	− 196	−0.058
Feb.	1.96	1.85	1.23	−0.195	− 663	664	0.195	1	0.000
Mar.	1.765	1.68	1.26	−0.080	− 272	670	0.197	398	0.117
April	1.685	1.69	1.25	+0.180	+ 612	668	0.196	1280	0.376
May	1.865	2.04	1.81	+0.235	+ 799	780	0.229	1579	0.464
June	2.10	2.16	1.99	+0.155	+ 527	816	0.240	1343	0.395
July	2.255	2.35	2.26	+0.190	+ 646	870	0.256	1516	0.446
Aug.	2.445	2.54	2.27	+0.160	+ 544	872	0.256	1416	0.416
Sept.	2.605	2.67	2.26	−0.015	− 51	870	0.256	819	0.012
Oct.	2.59	2.51	2.11	−0.235	− 799	840	0.247	41	0.241
Nov.	2.355	2.20	1.81	−0.305	−1037	780	0.229	− 257	−0.076
Dec.	2.05	1.90	1.43	−0.220	− 748	704	0.207	− 44	−0.013
1890									
Jan.	1.83	1.76	1.48	−0.135	− 459	714	0.210	255	0.075
Feb.	1.695	1.63	0.93	−0.185	− 629	604	0.178	− 25	−0.007
Mar.	1.51	1.39	0.92	−0.135	− 459	602	0.177	143	0.042
April	1.375	1.36	0.85	+0.090	+ 306	588	0.173	894	0.263
May	1.465	1.57	1.32	+0.330	+1122	682	0.201	1804	0.530
June	1.795	2.02	1.90	+0.375	+1275	798	0.235	2073	0.610
July	2.17	2.32	2.26	+0.225	+ 765	870	0.256	1635	0.481
Aug.	2.395	2.47	2.17	+0.140	+ 476	852	0.251	1328	0.390
Sept.	2.535	2.60	2.06	+0.050	+ 170	830	0.244	1000	0.294
Oct.	2.585	2.57	1.99	−0.120	− 408	816	0.240	408	0.120
Nov.	2.465	2.36	1.85	−0.285	− 969	788	0.232	− 181	−0.053
Dec.	2.18	2.00	1.55	−0.360	−1224	728	0.214	− 496	−0.146
1891									
Jan.	1.82	1.64	0.86	−0.245	− 833	590	0.173	− 243	−0.071
Feb.	1.575	1.51	0.97	−0.085	− 289	612	0.180	323	0.095
Mar.	1.49	1.47	0.82	−0.040	− 136	582	0.171	446	0.131
April	1.45	1.43	1.00	+0.080	+ 272	618	0.182	890	0.262
May	1.53	1.63	1.43	+0.125	+ 425	704	0.207	1129	0.332
June	1.655	1.68	1.38	+0.125	+ 425	694	0.204	1119	0.329
July	1.78	1.88	1.49	+0.090	+ 306	716	0.211	1022	0.301
Aug.	1.87	1.86	1.50	−0.030	− 102	718	0.211	616	0.181
Sept.	1.84	1.82	1.43	+0.025	+ 85	704	0.207	789	0.232
Oct.	1.865	1.91	1.49	−0.015	− 51	716	0.211	665	0.196
Nov.	1.85	1.79	1.38	−0.245	− 833	694	0.204	− 139	−0.041
Dec.	1.605	1.42	1.07	−0.185	− 629	632	0.186	3	0.001

SESSIONAL PAPER No. 54.

TABLE 24.—Continued.

SUPPLY FACTORS OF LAKE SUPERIOR

DATE.	WATER LEVELS OF—			STORAGE IN LAKE SUPERIOR.		OUTFLOW THROUGH ST. MARYS RIVER.		TOTAL SUPPLY TO LAKE SUPERIOR.	
	Lake Superior		St. Marys River.						
	Marquette, Mich. <i>a</i>		Sault Ste. Marie, Mich.						
	First of Month.	Mean of Month.	Mean of Month.	Ft. Depth.	100 c.f.s	100c.f.s	Ft. Depth, Lake Superior.	100 c.f.s.	Ft. Depth
1892									
Jan.	601.42	601.42	601.01	−0.140	− 476	620	0.182	144	0.042
Feb.	1.28	1.14	0.65	−0.205	− 697	548	0.161	− 149	−0.044
Mar.	1.075	1.01	0.47	−0.060	− 204	512	0.151	308	0.091
April	1.015	1.02	0.63	+0.170	+ 578	544	0.160	1122	0.330
May	1.185	1.35	1.14	+0.355	+1207	646	0.190	1853	0.545
June	1.54	1.73	1.50	+0.205	+ 697	718	0.211	1415	0.416
July	1.745	1.76	1.64	+0.075	+ 255	746	0.219	1001	0.294
Aug.	1.82	1.88	1.65	+0.085	+ 289	748	0.220	1037	0.305
Sept.	1.905	1.93	1.71	−0.025	− 85	760	0.223	675	0.198
Oct.	1.88	1.83	1.60	−0.135	− 459	738	0.217	279	0.082
Nov.	1.745	1.66	1.32	−0.225	− 765	682	0.201	− 83	−0.024
Dec.	1.52	1.38	1.04	−0.280	− 952	626	0.184	− 326	−0.096
1893									
Jan.	1.24	1.10	0.79	−0.185	− 629	519	0.153	− 110	−0.032
Feb.	1.055	1.01	0.59	−0.020	− 68	482	0.142	414	0.122
Mar.	1.035	1.06	0.60	+0.075	+ 255	484	0.142	739	0.217
April	1.11	1.16	0.85	+0.300	+1020	531	0.156	1551	0.456
May	1.41	1.66	1.42	+0.510	+1734	638	0.188	2372	0.698
June	1.92	2.18	1.95	+0.410	+1394	738	0.217	2132	0.627
July	2.33	2.48	2.15	+0.180	+ 612	775	0.228	1387	0.408
Aug.	2.51	2.54	2.23	−0.015	− 51	790	0.232	739	0.217
Sept.	2.495	2.45	2.10	−0.060	− 204	766	0.225	562	0.165
Oct.	2.435	2.42	2.04	−0.095	− 323	755	0.222	432	0.127
Nov.	2.34	2.26	1.99	−0.195	− 663	745	0.219	82	0.024
Dec.	2.145	2.03	1.45	−0.195	− 663	644	0.189	− 19	−0.006
1894									
Jan.	1.94	1.85	1.23	−0.180	− 612	602	0.177	− 10	−0.003
Feb.	1.76	1.67	1.15	−0.045	− 153	587	0.173	434	0.128
Mar.	1.715	1.76	1.04	+0.120	+ 408	566	0.166	974	0.286
April	1.835	1.91	1.42	+0.465	+1582	638	0.188	2220	0.653
May	2.30	2.69	2.40	+0.500	+1700	822	0.242	2522	0.742
June	2.80	2.91	2.64	+0.140	+ 476	868	0.255	1344	0.395
July	2.94	2.97	2.78	+0.095	+ 323	894	0.263	1217	0.358
Aug.	3.035	3.10	2.79	+0.025	+ 85	896	0.263	981	0.288
Sept.	3.06	3.02	2.66	−0.030	− 102	871	0.256	769	0.226
Oct.	3.03	3.04	2.70	−0.015	− 51	879	0.258	828	0.243
Nov.	3.015	2.99	2.60	−0.120	− 408	860	0.253	452	0.133
Dec.	2.895	2.80	2.30	−0.245	− 833	804	0.236	− 29	−0.009
1895									
Jan.	2.65	2.50	2.00	−0.260	− 884	747	0.220	− 137	−0.040
Feb.	2.39	2.28	1.86	−0.195	− 663	721	0.212	58	0.017
Mar.	2.195	2.11	1.66	−0.135	− 459	683	0.201	224	0.066
April	2.06	2.01	1.64	+0.135	+ 459	679	0.200	1138	0.335
May	2.195	2.38	2.04	+0.345	+1173	755	0.222	1928	0.567
June	2.54	2.70	2.43	+0.260	+ 884	828	0.243	1712	0.503
July	2.80	2.90	2.67	+0.125	+ 425	873	0.257	1298	0.382
Aug.	2.925	2.95	2.68	+0.095	+ 323	875	0.257	1198	0.352
Sept.	3.02	3.09	2.85	+0.095	+ 323	907	0.267	1230	0.362
Oct.	3.115	3.14	2.97	−0.120	− 408	930	0.273	522	0.153
Nov.	2.995	2.85	2.45	−0.310	−1054	832	0.245	− 222	−0.065
Dec.	2.685	2.52	2.24	−0.265	− 901	830	0.244	− 71	−0.021

TABLE 24.—Continued.

SUPPLY FACTORS OF LAKE SUPERIOR.

DATE.	WATER LEVELS OF—			STORAGE IN LAKE SUPERIOR.		OUTFLOW THROUGH ST. MARYS RIVER.		TOTAL SUPPLY TO LAKE SUPERIOR.	
	Lake Superior		St. Marys River.						
	Marquette, Mich. a		Sault Ste. Marie, Mich.						
	First of Month.	Mean of Month.	Mean of Month.	Ft. Depth.	100 c.f.s	100c.f.s	Ft. Depth, Lake Superior.	100 c.f.s.	Ft. Depth
1896									
Jan.	602.42	602.32	601.69	−0.200	− 680	727	0.214	47	0.014
Feb.	2.22	2.12	1.68	−0.200	− 680	687	0.202	7	0.002
Mar.	2.02	1.92	1.48	−0.055	− 187	649	0.191	462	0.136
April	1.965	2.01	1.57	+0.370	+1258	701	0.206	1959	0.576
May	2.335	2.66	2.18	+0.515	+1752	816	0.240	2568	0.755
June	2.85	3.04	2.59	+0.220	+ 748	893	0.263	1641	0.483
July	3.07	3.10	2.72	+0.040	+ 136	918	0.270	1054	0.310
Aug.	3.11	3.12	2.74	−0.075	− 255	921	0.271	666	0.196
Sept.	3.035	2.95	2.61	−0.245	− 833	897	0.264	64	0.019
Oct.	2.79	2.63	2.18	−0.125	− 425	816	0.240	391	0.115
Nov.	2.665	2.70	2.21	−0.040	− 136	822	0.242	686	0.202
Dec.	2.625	2.55	2.15	−0.155	− 527	810	0.238	283	0.083
1897									
Jan.	2.47	2.39	1.92	−0.195	− 663	767	0.226	104	0.031
Feb.	2.275	2.16	1.61	−0.155	− 527	709	0.208	182	0.053
Mar.	2.12	2.08	1.63	−0.025	− 85	712	0.209	627	0.184
April	2.095	2.11	1.76	+0.185	+ 629	737	0.217	1366	0.402
May	2.28	2.45	2.11	+0.335	+1139	803	0.236	1942	0.571
June	2.615	2.78	2.47	+0.315	+1071	871	0.256	1942	0.571
July	2.93	3.08	2.69	+0.210	+ 714	912	0.268	1626	0.478
Aug.	3.14	3.20	2.85	+0.030	+ 102	942	0.277	1044	0.307
Sept.	3.17	3.14	2.68	−0.130	− 442	910	0.268	468	0.138
Oct.	3.04	2.94	2.47	−0.250	− 850	871	0.256	21	0.006
Nov.	2.79	2.64	2.36	−0.365	−1241	850	0.250	− 391	−0.115
Dec.	2.425	2.21	1.87	−0.405	−1377	758	0.223	− 619	−0.182
1898									
Jan.	2.02	1.83	1.38	−0.280	− 952	670	0.197	− 282	−0.083
Feb.	1.74	1.65	1.15	−0.185	− 629	627	0.184	− 2	−0.001
Mar.	1.555	1.46	1.00	−0.095	− 323	599	0.176	276	0.081
April	1.46	1.46	1.13	+0.120	+ 408	623	0.183	1031	0.303
May	1.58	1.70	1.42	+0.360	+1224	678	0.199	1902	0.559
June	1.94	2.18	1.83	+0.445	+1513	755	0.222	2268	0.667
July	2.385	2.59	2.17	+0.270	+ 918	819	0.241	1737	0.511
Aug.	2.655	2.72	2.28	+0.115	+ 391	841	0.247	1232	0.362
Sept.	2.77	2.82	2.42	+0.020	+ 68	866	0.255	934	0.275
Oct.	2.79	2.76	2.26	−0.130	− 442	836	0.246	394	0.116
Nov.	2.66	2.56	2.09	−0.215	− 731	804	0.236	73	0.021
Dec.	2.445	2.33	2.01	−0.300	−1020	789	0.232	− 231	−0.068
1899									
Jan.	2.145	1.96	1.53	−0.285	− 969	699	0.206	−2701	−0.079
Feb.	1.86	1.76	1.37	−0.085	− 289	668	0.196	379	0.111
Mar.	1.775	1.79	1.26	0.000	0	648	0.191	648	0.191
April	1.775	1.76	1.26	+0.340	+1156	657	0.193	1813	0.533
May	2.115	2.47	2.12	+0.600	+2041	819	0.241	2860	0.841
June	2.715	2.96	2.56	+0.360	+1224	902	0.265	2126	0.625
July	3.075	3.19	2.76	+0.195	+ 663	940	0.276	1603	0.471
Aug.	3.27	3.35	2.91	+0.160	+ 544	968	0.285	1512	0.445
Sept.	3.43	3.51	3.10	−0.015	− 51	1004	0.295	953	0.280
Oct.	3.415	3.32	2.77	−0.150	− 510	942	0.277	432	0.127
Nov.	3.265	3.21	2.69	−0.160	− 544	926	0.272	382	0.112
Dec.	3.105	3.00	2.64	−0.290	− 986	917	0.270	− 69	−0.020

SESSIONAL PAPER No. 54.

TABLE 24.—Continued.

SUPPLY FACTORS OF LAKE SUPERIOR.

DATE.	WATER LEVELS OF—			STORAGE IN LAKE SUPERIOR.		OUTFLOW THROUGH ST. MARYS RIVER.		TOTAL SUPPLY TO LAKE SUPERIOR.	
	Lake Superior		St. Marys River.						
	Marquette, Mich. <i>a</i>		Sault Ste. Marie, Mich.						
	First of Month.	Mean of Month.	Mean of Month.	Ft. Depth.	100 c.f.s	100c.f.s	Ft. Depth, Lake Superior.	100 c.f.s.	Ft. Depth
1900									
Jan.	602.815	602.63	602.03	−0.275	− 935	793	0.233	− 142	−0.042
Feb.	2.54	2.45	1.90	−0.200	− 680	770	0.226	90	0.026
Mar.	2.34	2.23	1.64	−0.160	− 544	723	0.213	179	0.053
April	2.18	2.13	1.68	+0.035	+ 119	730	0.215	849	0.250
May	2.215	2.30	1.87	+0.115	+ 391	764	0.225	1155	0.340
June	2.33	2.36	1.94	+0.140	+ 476	777	0.228	1253	0.368
July	2.47	2.58	2.17	+0.290	+ 986	818	0.241	1804	0.530
Aug.	2.76	2.94	2.39	+0.440	+1496	857	0.252	2353	0.692
Sept.	3.20	3.46	2.90	+0.300	+1020	948	0.279	1968	0.579
Oct.	3.50	3.54	2.93	+0.025	+ 85	954	0.280	1039	0.305
Nov.	3.525	3.51	3.04	−0.205	− 697	974	0.286	277	0.081
Dec.	3.32	3.13	2.63	−0.365	−1241	900	0.265	− 341	−0.100
1901									
Jan.	2.955	2.78	2.17	−0.325	−1105	818	0.241	− 287	−0.084
Feb.	2.63	2.48	1.87	−0.250	− 850	764	0.225	− 86	0.025
Mar.	2.38	2.28	1.65	−0.130	− 442	725	0.213	283	−0.083
April	2.25	2.22	1.76	+0.115	+ 391	745	0.219	1136	0.334
May	2.365	2.51	2.06	+0.195	+ 663	798	0.235	1461	0.430
June	2.56	2.61	2.15	+0.290	+ 986	814	0.239	1800	0.529
July	2.85	3.09	2.56	+0.305	+1037	888	0.261	1925	0.566
Aug.	3.155	3.22	2.74	−0.025	− 85	920	0.270	835	0.246
Sept.	3.13	3.04	2.60	−0.075	− 255	895	0.263	640	0.188
Oct.	3.055	3.07	2.72	−0.020	− 68	798	0.235	730	0.215
Nov.	3.035	3.00	2.66	−0.195	− 663	788	0.232	125	0.037
Dec.	2.84	2.68	2.27	−0.340	−1156	728	0.214	− 428	−0.126
1902									
Jan.	2.50	2.32	1.90	−0.285	− 969	670	0.197	− 299	−0.088
Feb.	2.215	2.11	1.61	−0.175	− 595	625	0.184	30	0.009
Mar.	2.04	1.97	1.53	−0.045	− 153	613	0.180	460	0.135
April	1.995	2.02	1.69	+0.185	+ 629	638	0.188	1267	0.373
May	2.18	2.34	1.88	+0.310	+1054	667	0.196	1721	0.506
June	2.49	2.64	2.25	+0.270	+ 918	725	0.213	1643	0.483
July	2.76	2.88	2.48	+0.125	+ 425	760	0.223	1185	0.348
Aug.	2.885	2.89	2.49	+0.025	+ 85	762	0.224	847	0.249
Sept.	2.91	2.93	2.54	−0.040	− 136	770	0.226	634	0.186
Oct.	2.87	2.81	2.39	−0.060	− 204	746	0.219	542	0.159
Nov.	2.81	2.81	2.46	−0.115	− 391	757	0.223	366	0.108
Dec.	2.695	2.58	2.29	−0.285	− 969	731	0.215	− 238	0.070
1903									
Jan.	2.41	2.24	1.83	−0.300	−1020	660	0.194	− 360	−0.106
Feb.	2.11	1.98	1.60	−0.180	− 612	624	0.183	12	0.003
Mar.	1.93	1.88	1.51	+0.045	+ 153	610	0.179	763	0.224
April	1.975	2.07	1.76	+0.340	+1156	649	0.191	1805	0.531
May	2.315	2.56	2.15	+0.435	+1479	709	0.208	2188	0.643
June	2.75	2.94	2.57	+0.290	+ 986	774	0.228	1760	0.518
July	2.04	3.14	2.70	+0.155	+ 527	795	0.234	1322	0.389
Aug.	3.195	3.25	2.80	+0.065	+ 221	810	0.238	1031	0.303
Sept.	3.26	3.27	2.82	+0.075	+ 255	813	0.239	1068	0.314
Oct.	3.335	3.40	2.98	−0.045	− 153	838	0.246	685	0.201
Nov.	3.29	3.18	2.85	−0.300	−1020	818	0.241	− 202	−0.059
Dec.	2.99	2.80	2.41	−0.340	−1156	750	0.221	− 406	−0.119

TABLE 24.—Continued.

SUPPLY FACTORS OF LAKE SUPERIOR.

DATE.	WATER LEVELS OF—			STORAGE IN LAKE SUPERIOR.		OUTFLOW THROUGH ST. MARYS RIVER.		TOTAL SUPPLY TO LAKE SUPERIOR.	
	Lake Superior		St. Marys River.						
	Marquette, Mich. a		Sault Ste. Marie, Mich.						
	First of Month.	Mean of Month.	Mean of Month.	Ft. Depth.	100 c.f.s	100c.f.s	Ft. Depth, Lake Superior.	100 c.f.s.	Ft. Depth
1904									
Jan.	602.65	602.50	601.87	−0.235	− 799	666	0.196	− 133	−0.039
Feb.	2.445	2.33	1.64	−0.135	− 459	630	0.185	171	0.050
Mar.	2.28	2.23	1.40	−0.080	− 272	593	0.174	321	0.094
April	2.20	2.17	1.76	+0.120	+ 408	649	0.191	1057	0.311
May	2.32	2.47	2.09	+0.300	+1020	700	0.206	1720	0.506
June	2.62	2.77	2.34	+0.195	+ 663	739	0.217	1402	0.412
July	2.815	2.86	2.48	+0.090	+ 306	760	0.223	1066	0.313
Aug.	2.905	2.95	2.55	+0.110	+ 374	771	0.227	1145	0.337
Sept.	3.015	3.08	2.65	+0.155	+ 527	787	0.231	1314	0.386
Oct.	3.17	3.26	2.82	+0.055	+ 187	813	0.239	1000	0.294
Nov.	3.225	3.19	2.71	−0.260	− 884	796	0.234	− 88	−0.026
Dec.	2.965	2.74	2.30	−0.360	−1224	732	0.215	− 492	−0.145
1905									
Jan.	2.605	2.47	2.00	−0.305	−1037	788	0.232	− 249	−0.073
Feb.	2.30	2.13	1.59	−0.215	− 731	712	0.209	− 19	−0.001
Mar.	2.085	2.04	1.36	+0.060	+ 204	670	0.197	874	0.257
April	2.145	2.25	1.78	+0.225	+ 765	747	0.220	1512	0.445
May	2.37	2.49	2.07	+0.210	+ 714	801	0.236	1515	0.445
June	2.58	2.67	2.25	+0.240	+ 816	834	0.245	1650	0.485
July	2.82	2.97	2.60	+0.215	+ 731	899	0.264	1630	0.479
Aug.	3.035	3.10	2.73	+0.175	+ 595	923	0.271	1518	0.446
Sept.	3.21	3.32	2.92	+0.115	+ 391	958	0.282	1349	0.397
Oct.	3.325	3.33	2.96	−0.075	− 255	965	0.284	710	0.209
Nov.	3.25	3.17	2.73	−0.185	− 629	923	0.271	294	0.086
Dec.	3.065	2.96	2.52	−0.225	− 765	884	0.260	119	0.035
1906									
Jan.	2.84	2.72	2.18	−0.265	− 901	821	0.241	− 80	−0.024
Feb.	2.575	2.43	1.85	−0.250	− 850	760	0.223	− 90	0.026
Mar.	2.325	2.22	1.63	−0.140	− 476	720	0.212	244	0.072
April	2.185	2.15	1.70	+0.130	+ 442	733	0.216	1175	0.346
May	2.315	2.48	2.02	+0.315	+1071	792	0.233	1863	0.548
June	2.63	2.78	2.30	+0.210	+ 714	843	0.248	1557	0.458
July	2.84	2.90	2.50	+0.075	+ 255	880	0.259	1135	0.334
Aug.	2.915	2.93	2.46	+0.025	+ 85	873	0.257	958	0.282
Sept.	2.94	2.95	2.46	−0.045	− 153	873	0.257	720	0.212
Oct.	2.895	2.84	2.36	−0.145	− 493	855	0.251	362	0.106
Nov.	2.75	2.66	2.19	−0.195	− 663	823	0.242	160	0.047
Dec.	2.555	2.45	1.95	−0.220	− 748	779	0.229	31	0.009
1907									
Jan.	2.335	2.22	1.62	−0.195	− 663	718	0.211	55	0.016
Feb.	2.14	2.06	1.43	−0.140	− 476	683	0.201	207	0.061
Mar.	2.00	1.94	1.34	−0.060	− 204	666	0.196	462	0.136
April	1.94	1.94	1.59	+0.080	+ 272	712	0.209	984	0.289
May	2.02	2.10	1.71	+0.305	+1037	734	0.216	1771	0.521
June	2.325	2.55	2.12	+0.300	+1020	810	0.238	1830	0.538
July	2.625	2.70	2.33	+0.190	+ 646	849	0.250	1495	0.440
Aug.	2.815	2.93	2.50	+0.235	+ 799	880	0.259	1679	0.494
Sept.	3.05	3.17	2.70	+0.110	+ 374	917	0.270	1291	0.380
Oct.	3.16	3.15	2.71	−0.145	− 493	919	0.270	426	0.125
Nov.	3.015	2.88	2.56	−0.310	−1054	891	0.262	− 163	−0.048
Dec.	2.705	2.53	2.08			803	0.236		

TABLE 25. SUPPLY FACTORS OF LAKE MICHIGAN-HURON.

DATE	WATER LEVELS OF DETROIT RIVER.				STORAGE IN LAKE ST. CLAIR.		WATER LEVELS OF LAKE MICHIGAN-HURON.				STORAGE IN LAKE MICHIGAN-HURON, Mich.		STORAGE IN LAKE MICHIGAN-HURON, Lake St. Clair.		OUTFLOW THROUGH DETROIT RIVER.		TOTAL SUPPLY TO LAKE MICHIGAN-HURON.		INFLOW FROM ST. MARYS RIVER.		LOCAL SUPPLY TO LAKE MICHIGAN-HURON.		
	Windmill Point.		Amherstburg, Ont.		Lake St. Clair.		Lake Michigan-Huron.		Mean of Month.		Mean of Month.		Foot Depth.		Foot Depth.		100 c. f. s.		100 c. f. s.		Foot Depth.		
	First of Month.	Mean of Month.	First of Month.	Mean of Month.	Foot Depth.	Equivalent Foot Depth.	Foot Depth.	Foot Depth.	Mean of Month.	Mean of Month.	Foot Depth.	Foot Depth.	100 c. f. s.	100 c. f. s.	100 c. f. s.	100 c. f. s.	100 c. f. s.	100 c. f. s.	100 c. f. s.	100 c. f. s.	Foot Depth.		
	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	
1860																							
Jan.	575.22	4.51	573.48	3.12	-0.14	-0.002	582.51	582.83	582.67	+0.076	+0.074	+0.074	+0.074	+0.074	+0.074	2125	0.442	1803	0.375	942	0.196	923	0.192
Feb.	575.22	4.51	573.48	3.12	-0.14	-0.002	582.51	582.83	582.67	+0.076	+0.074	+0.074	+0.074	+0.074	+0.074	1447	0.301	1803	0.375	880	0.183	923	0.192
Mar.	575.22	4.51	573.48	3.12	-0.14	-0.002	582.51	582.83	582.67	+0.076	+0.074	+0.074	+0.074	+0.074	+0.074	1942	0.404	2312	0.481	874	0.182	1437	0.299
April	575.22	4.51	573.48	3.12	-0.14	-0.002	582.51	582.83	582.67	+0.076	+0.074	+0.074	+0.074	+0.074	+0.074	2051	0.427	2402	0.500	932	0.194	1470	0.306
May	575.22	4.51	573.48	3.12	-0.14	-0.002	582.51	582.83	582.67	+0.076	+0.074	+0.074	+0.074	+0.074	+0.074	2214	0.461	2868	0.597	1018	0.212	1850	0.385
June	575.22	4.51	573.48	3.12	-0.14	-0.002	582.51	582.83	582.67	+0.076	+0.074	+0.074	+0.074	+0.074	+0.074	2326	0.484	2903	0.604	1062	0.221	1841	0.383
July	575.22	4.51	573.48	3.12	-0.14	-0.002	582.51	582.83	582.67	+0.076	+0.074	+0.074	+0.074	+0.074	+0.074	2002	0.417	1810	0.377	1062	0.221	1841	0.383
Aug.	575.22	4.51	573.48	3.12	-0.14	-0.002	582.51	582.83	582.67	+0.076	+0.074	+0.074	+0.074	+0.074	+0.074	1995	0.415	1192	0.248	1075	0.224	117	0.024
Sept.	575.22	4.51	573.48	3.12	-0.14	-0.002	582.51	582.83	582.67	+0.076	+0.074	+0.074	+0.074	+0.074	+0.074	1894	0.394	601	0.125	1057	0.220	456	-0.095
Oct.	575.22	4.51	573.48	3.12	-0.14	-0.002	582.51	582.83	582.67	+0.076	+0.074	+0.074	+0.074	+0.074	+0.074	2376	0.494	992	0.206	1066	0.222	74	-0.015
Nov.	575.22	4.51	573.48	3.12	-0.14	-0.002	582.51	582.83	582.67	+0.076	+0.074	+0.074	+0.074	+0.074	+0.074	1935	0.403	834	0.174	1025	0.213	191	-0.010
Dec.	575.22	4.51	573.48	3.12	-0.14	-0.002	582.51	582.83	582.67	+0.076	+0.074	+0.074	+0.074	+0.074	+0.074	2250	0.468	1327	0.276	932	0.194	395	0.082
1861																							
Jan.	596	5.98	2.83	2.83	-0.67	-0.007	1.83	1.99	1.91	-0.048	-0.055	-0.055	-0.055	-0.055	-0.055	2306	0.480	2042	0.425	875	0.182	1167	0.243
Feb.	596	5.98	2.83	2.83	-0.67	-0.007	1.83	1.99	1.91	-0.048	-0.055	-0.055	-0.055	-0.055	-0.055	1723	0.358	2516	0.523	813	0.169	1703	0.354
Mar.	596	5.98	2.83	2.83	-0.67	-0.007	1.83	1.99	1.91	-0.048	-0.055	-0.055	-0.055	-0.055	-0.055	2166	0.451	3214	0.669	780	0.162	2434	0.506
April	596	5.98	2.83	2.83	-0.67	-0.007	1.83	1.99	1.91	-0.048	-0.055	-0.055	-0.055	-0.055	-0.055	2290	0.476	3924	0.816	870	0.181	3054	0.635
May	596	5.98	2.83	2.83	-0.67	-0.007	1.83	1.99	1.91	-0.048	-0.055	-0.055	-0.055	-0.055	-0.055	2164	0.450	4024	0.837	1048	0.218	2976	0.619
June	596	5.98	2.83	2.83	-0.67	-0.007	1.83	1.99	1.91	-0.048	-0.055	-0.055	-0.055	-0.055	-0.055	2274	0.473	3178	0.661	1087	0.226	2091	0.435
July	596	5.98	2.83	2.83	-0.67	-0.007	1.83	1.99	1.91	-0.048	-0.055	-0.055	-0.055	-0.055	-0.055	2324	0.484	3050	0.635	1133	0.236	1917	0.399
Aug.	596	5.98	2.83	2.83	-0.67	-0.007	1.83	1.99	1.91	-0.048	-0.055	-0.055	-0.055	-0.055	-0.055	2409	0.501	2361	0.491	1126	0.234	1235	0.257
Sept.	596	5.98	2.83	2.83	-0.67	-0.007	1.83	1.99	1.91	-0.048	-0.055	-0.055	-0.055	-0.055	-0.055	2358	0.491	1469	0.306	1092	0.227	377	0.079
Oct.	596	5.98	2.83	2.83	-0.67	-0.007	1.83	1.99	1.91	-0.048	-0.055	-0.055	-0.055	-0.055	-0.055	2299	0.478	1232	0.256	1098	0.228	134	0.028
Nov.	596	5.98	2.83	2.83	-0.67	-0.007	1.83	1.99	1.91	-0.048	-0.055	-0.055	-0.055	-0.055	-0.055	2262	0.471	1248	0.260	1018	0.212	230	0.048
Dec.	596	5.98	2.83	2.83	-0.67	-0.007	1.83	1.99	1.91	-0.048	-0.055	-0.055	-0.055	-0.055	-0.055	2264	0.471	1197	0.249	919	0.191	278	0.058
1862																							
Jan.	609	5.90	3.65	3.65	-0.73	-0.008	2.33	2.44	2.385	-0.185	-0.193	-0.193	-0.193	-0.193	-0.193	2053	0.427	1125	0.234	826	0.172	299	0.062
Feb.	609	5.90	3.65	3.65	-0.73	-0.008	2.33	2.44	2.385	-0.185	-0.193	-0.193	-0.193	-0.193	-0.193	1521	0.316	1579	0.328	778	0.162	801	0.167
Mar.	609	5.90	3.65	3.65	-0.73	-0.008	2.33	2.44	2.385	-0.185	-0.193	-0.193	-0.193	-0.193	-0.193	2024	0.421	2774	0.577	785	0.163	1989	0.414
April	609	5.90	3.65	3.65	-0.73	-0.008	2.33	2.44	2.385	-0.185	-0.193	-0.193	-0.193	-0.193	-0.193	2446	0.509	3672	0.764	794	0.165	2878	0.599
May	609	5.90	3.65	3.65	-0.73	-0.008	2.33	2.44	2.385	-0.185	-0.193	-0.193	-0.193	-0.193	-0.193	2358	0.491	3411	0.710	983	0.204	2428	0.505
June	609	5.90	3.65	3.65	-0.73	-0.008	2.33	2.44	2.385	-0.185	-0.193	-0.193	-0.193	-0.193	-0.193	2393	0.498	2633	0.548	986	0.205	1617	0.343
July	609	5.90	3.65	3.65	-0.73	-0.008	2.33	2.44	2.385	-0.185	-0.193	-0.193	-0.193	-0.193	-0.193	2370	0.493	2269	0.472	988	0.206	1281	0.266
Aug.	609	5.90	3.65	3.65	-0.73	-0.008	2.33	2.44	2.385	-0.185	-0.193	-0.193	-0.193	-0.193	-0.193	2428	0.505	2034	0.423	1029	0.214	1005	0.209
Sept.	609	5.90	3.65	3.65	-0.73	-0.008	2.33	2.44	2.385	-0.185	-0.193	-0.193	-0.193	-0.193	-0.193	2411	0.502	2252	0.469	1043	0.217	1209	0.252
Oct.	609	5.90	3.65	3.65	-0.73	-0.008	2.33	2.44	2.385	-0.185	-0.193	-0.193	-0.193	-0.193	-0.193	2398	0.499	1730	0.360	1027	0.214	703	0.146
Nov.	609	5.90	3.65	3.65	-0.73	-0.008	2.33	2.44	2.385	-0.185	-0.193	-0.193	-0.193	-0.193	-0.193	2362	0.491	982	0.204	949	0.197	33	0.007
Dec.	609	5.90	3.65	3.65	-0.73	-0.008	2.33	2.44	2.385	-0.185	-0.193	-0.193	-0.193	-0.193	-0.193	2212	0.460	1414	0.294	875	0.182	539	0.112

a.--St. Clair River discharge used.

TABLE 25.—Continued. SUPPLY FACTORS OF LAKE MICHIGAN-HURON.

DATE	WATER LEVELS OF DETROIT RIVER.				STORAGE IN LAKE ST. CLAIR.				WATER LEVELS OF LAKE MICHIGAN-HURON.				STORAGE IN LAKE MICHIGAN-HURON AND LAKE ST. CLAIR.		OUTFLOW THROUGH DETROIT RIVER.		TOTAL SUPPLY TO LAKE MICHIGAN-HURON.		INFLOW FROM ST. MARYS RIVER.		LOCAL SUPPLY TO LAKE MICHIGAN-HURON.	
	Windmill Point.		Antherburg, Ont.		LAKE ST. CLAIR.		LAKE MICHIGAN-HURON.		LAKE MICHIGAN-HURON.		LAKE MICHIGAN-HURON.		LAKE MICHIGAN-HURON.		LAKE MICHIGAN-HURON.		LAKE MICHIGAN-HURON.		LAKE MICHIGAN-HURON.		LAKE MICHIGAN-HURON.	
	First of Month.	Mean of Month.	First of Month.	Mean of Month.	Foot Depth.	Equivalent Foot Depth.	Foot Depth.	Mean of Month.	Foot Depth.	Mean of Month.	Foot Depth.	Mean of Month.	Foot Depth.	Mean of Month.	Foot Depth.	Mean of Month.	Foot Depth.	Mean of Month.	Foot Depth.	Mean of Month.	Foot Depth.	Mean of Month.
1863	576.02	576.09	573.68	582.13	582.36	582.24	582.30	2.18	2.21	2.195	2.220	2.180	2.165	2.180	2.182	2.182	2.182	2.182	2.182	2.182	2.182	2.182
Jan.	6.08	6.08	3.97	2.18	2.21	2.195	2.220	2.180	2.165	2.180	2.182	2.182	2.165	2.180	2.182	2.182	2.182	2.182	2.182	2.182	2.182	2.182
Feb.	5.96	5.85	3.93	2.17	2.16	2.165	2.180	2.17	2.16	2.165	2.180	2.180	2.165	2.180	2.182	2.182	2.182	2.182	2.182	2.182	2.182	2.182
Mar.	6.11	6.37	4.00	2.17	2.23	2.20	2.182	2.17	2.23	2.20	2.182	2.182	2.20	2.182	2.182	2.182	2.182	2.182	2.182	2.182	2.182	2.182
April	6.54	6.70	4.27	2.38	2.55	2.465	2.332	2.38	2.55	2.465	2.332	2.332	2.55	2.465	2.332	2.332	2.332	2.332	2.332	2.332	2.332	2.332
May	6.64	6.58	4.12	2.47	2.68	2.575	2.520	2.47	2.68	2.575	2.520	2.520	2.68	2.575	2.520	2.520	2.520	2.520	2.520	2.520	2.520	2.520
June	6.59	6.60	4.01	2.42	2.59	2.505	2.540	2.42	2.59	2.505	2.540	2.540	2.59	2.505	2.540	2.540	2.540	2.540	2.540	2.540	2.540	2.540
July	6.58	6.57	3.97	2.29	2.60	2.445	2.475	2.29	2.60	2.445	2.475	2.475	2.60	2.445	2.475	2.475	2.475	2.475	2.475	2.475	2.475	2.475
Aug.	6.46	6.36	3.52	2.11	2.46	2.285	2.365	2.11	2.46	2.285	2.365	2.365	2.46	2.285	2.365	2.365	2.365	2.365	2.365	2.365	2.365	2.365
Sept.	6.09	5.82	3.07	2.02	2.20	2.11	2.198	2.02	2.20	2.11	2.198	2.198	2.20	2.11	2.198	2.198	2.198	2.198	2.198	2.198	2.198	2.198
Oct.	5.73	5.64	2.53	1.58	2.16	1.87	1.990	1.58	2.16	1.87	1.990	1.990	2.16	1.87	1.990	1.990	1.990	1.990	1.990	1.990	1.990	1.990
Nov.	5.59	5.54	2.62	1.92	1.93	1.925	1.898	1.92	1.93	1.925	1.898	1.898	1.93	1.925	1.898	1.898	1.898	1.898	1.898	1.898	1.898	1.898
Dec.	5.64	5.75	2.31	1.69	1.79	1.74	1.832	1.69	1.79	1.74	1.832	1.832	1.79	1.74	1.832	1.832	1.832	1.832	1.832	1.832	1.832	1.832
1864	5.46	5.17	2.46	1.55	1.75	1.65	1.695	1.55	1.75	1.65	1.695	1.695	1.75	1.65	1.695	1.695	1.695	1.695	1.695	1.695	1.695	1.695
Jan.	5.24	5.31	2.69	1.80	1.75	1.775	1.712	1.80	1.75	1.775	1.712	1.712	1.75	1.775	1.712	1.712	1.712	1.712	1.712	1.712	1.712	1.712
Feb.	5.68	6.04	3.14	1.51	1.95	1.73	1.752	1.51	1.95	1.73	1.752	1.752	1.95	1.73	1.752	1.752	1.752	1.752	1.752	1.752	1.752	1.752
Mar.	6.27	6.50	3.93	2.02	2.38	2.20	1.965	2.02	2.38	2.20	1.965	1.965	2.38	2.20	1.965	1.965	1.965	1.965	1.965	1.965	1.965	1.965
April	6.60	6.71	3.87	2.01	2.39	2.20	2.200	2.01	2.39	2.20	2.200	2.200	2.39	2.20	2.200	2.200	2.200	2.200	2.200	2.200	2.200	2.200
May	6.58	6.44	3.62	1.91	2.34	2.125	2.162	1.91	2.34	2.125	2.162	2.162	2.34	2.125	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.162
June	6.34	6.25	3.39	1.73	2.23	1.98	2.052	1.73	2.23	1.98	2.052	2.052	2.23	1.98	2.052	2.052	2.052	2.052	2.052	2.052	2.052	2.052
July	6.14	6.04	3.11	1.46	1.91	1.685	1.832	1.46	1.91	1.685	1.832	1.832	1.91	1.685	1.832	1.832	1.832	1.832	1.832	1.832	1.832	1.832
Aug.	5.78	5.51	2.79	1.07	1.38	1.225	1.455	1.07	1.38	1.225	1.455	1.455	1.38	1.225	1.455	1.455	1.455	1.455	1.455	1.455	1.455	1.455
Sept.	5.46	5.42	2.49	0.90	1.21	1.055	1.140	0.90	1.21	1.055	1.140	1.140	1.21	1.055	1.140	1.140	1.140	1.140	1.140	1.140	1.140	1.140
Oct.	5.44	5.47	2.68	0.77	1.08	0.925	0.990	0.77	1.08	0.925	0.990	0.990	1.08	0.925	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
1865	4.80	4.14	2.23	0.56	0.72	0.64	0.782	0.56	0.72	0.64	0.782	0.782	0.72	0.64	0.782	0.782	0.782	0.782	0.782	0.782	0.782	0.782
Jan.	3.80	3.45	1.65	0.65	0.81	0.73	0.685	0.65	0.81	0.73	0.685	0.685	0.81	0.73	0.685	0.685	0.685	0.685	0.685	0.685	0.685	0.685
Feb.	3.82	4.18	1.99	0.82	0.98	0.90	0.815	0.82	0.98	0.90	0.815	0.815	0.98	0.90	0.815	0.815	0.815	0.815	0.815	0.815	0.815	0.815
Mar.	4.78	5.38	2.66	1.31	1.47	1.39	1.145	1.31	1.47	1.39	1.145	1.145	1.47	1.39	1.145	1.145	1.145	1.145	1.145	1.145	1.145	1.145
April	5.68	5.97	3.33	1.47	1.63	1.55	1.470	1.47	1.63	1.55	1.470	1.470	1.63	1.55	1.470	1.470	1.470	1.470	1.470	1.470	1.470	1.470
May	6.00	6.02	3.30	1.51	1.67	1.59	1.570	1.51	1.67	1.59	1.570	1.570	1.67	1.59	1.570	1.570	1.570	1.570	1.570	1.570	1.570	1.570
June	6.10	6.17	3.27	1.94	2.10	2.02	1.805	1.94	2.10	2.02	1.805	1.805	2.10	2.02	1.805	1.805	1.805	1.805	1.805	1.805	1.805	1.805
July	6.16	6.16	3.23	1.96	2.12	2.04	2.030	1.96	2.12	2.04	2.030	2.030	2.12	2.04	2.030	2.030	2.030	2.030	2.030	2.030	2.030	2.030
Aug.	6.12	6.07	3.13	1.84	2.00	1.92	1.980	1.84	2.00	1.92	1.980	1.980	2.00	1.92	1.980	1.980	1.980	1.980	1.980	1.980	1.980	1.980
Sept.	5.94	5.82	2.82	1.60	1.76	1.68	1.800	1.60	1.76	1.68	1.800	1.800	1.76	1.68	1.800	1.800	1.800	1.800	1.800	1.800	1.800	1.800
Oct.	5.59	5.36	2.31	1.04	1.20	1.12	1.400	1.04	1.20	1.12	1.400	1.400	1.20	1.12	1.400	1.400	1.400	1.400	1.400	1.400	1.400	1.400
Nov.	5.26	5.16	2.29	0.73	0.89	0.81	0.965	0.73	0.89	0.81	0.965	0.965	0.89	0.81	0.965	0.965	0.965	0.965	0.965	0.965	0.965	0.965
Dec.																						

a.—St. Clair River discharge used.

SESSIONAL PAPER No. 54.

1866	5.10	5.03	2.00	-0.39	-0.003	0.47	0.63	0.55	0.680	-0.250	-0.253	-1216	a2026	0.421	810	0.169	723	0.150	87	0.018
Jan.	4.80	4.58	1.84	-0.18	-0.002	0.23	0.39	0.31	0.430	-0.095	-0.097	-466	1928	0.401	1462	0.304	670	0.139	792	0.165
Feb.	4.62	4.66	2.25	+0.44	+0.005	0.28	0.44	0.36	0.335	+0.247	+0.252	+1211	1850	0.385	3061	0.637	670	0.139	2391	0.497
Mar.	5.06	5.46	2.78	+0.49	+0.005	0.73	0.88	0.805	0.582	+0.316	+0.321	+1543	a1964	0.409	3507	0.729	769	0.160	2738	0.570
Apr.	5.55	5.64	3.09	+0.24	+0.003	0.91	1.07	0.99	0.898	+0.237	+0.240	+1154	2098	0.436	3252	0.677	859	0.179	2393	0.498
May	5.79	5.94	3.34	+0.26	+0.003	1.20	1.36	1.28	1.135	+0.275	+0.278	+1336	2183	0.454	3519	0.732	907	0.189	2612	0.543
June	6.05	6.16	3.46	+0.04	0.000	1.46	1.62	1.54	1.410	+0.160	+0.160	+769	2268	0.472	3037	0.632	983	0.204	2054	0.427
July	6.09	6.02	3.25	-0.11	-0.001	1.52	1.68	1.60	1.570	-0.045	-0.046	-221	2256	0.469	2035	0.423	1038	0.216	997	0.205
Aug.	5.98	5.93	3.13	-0.07	-0.001	1.37	1.53	1.45	1.525	-0.130	-0.131	-630	2243	0.467	1613	0.336	962	0.200	651	0.135
Sept.	5.91	5.89	3.11	-0.10	-0.001	1.26	1.42	1.34	1.395	-0.100	-0.101	-486	2228	0.463	1742	0.362	967	0.201	775	0.161
Oct.	5.81	5.73	2.74	-0.03	0.000	1.17	1.33	1.25	1.295	-0.175	-0.175	-841	2295	0.477	1454	0.302	889	0.185	565	0.118
Nov.	5.78	5.84	2.87	-0.40	-0.004	0.91	1.07	0.99	1.120	-0.140	-0.144	-692	2272	0.473	1580	0.329	903	0.188	677	0.141
Dec.																				
1867	5.38	4.91	2.56	+0.55	+0.006	0.89	1.05	0.97	0.980	+0.015	+0.021	+101	1881	0.391	1982	0.412	829	0.172	1153	0.240
Jan.	5.93	4.95	2.24	-1.19	-0.013	0.94	1.10	1.02	0.995	+0.115	+0.102	+490	1996	0.415	2186	0.517	799	0.166	1687	0.351
Feb.	4.74	4.52	2.66	+0.42	+0.005	1.12	1.28	1.20	1.110	+0.235	+0.240	+1154	1641	0.341	2795	0.581	755	0.157	2040	0.424
Mar.	5.16	5.80	2.93	+0.87	+0.010	1.41	1.57	1.49	1.345	+0.255	+0.265	+1274	a2118	0.441	3392	0.706	801	0.167	2591	0.539
Apr.	6.03	6.26	3.54	+0.43	+0.005	1.63	1.79	1.71	1.600	+0.265	+0.270	+1298	2299	0.478	3597	0.748	834	0.173	2763	0.575
May	6.46	6.65	3.84	+0.10	+0.001	1.94	2.10	2.02	1.865	+0.230	+0.231	+1110	2427	0.505	3537	0.736	976	0.203	2561	0.533
June	6.56	6.47	3.66	-0.13	-0.001	2.09	2.25	2.17	2.095	+0.040	+0.039	+187	2381	0.495	2568	0.534	1062	0.221	1506	0.313
July	6.43	6.39	3.39	-0.23	-0.003	2.02	2.18	2.10	2.135	-0.170	-0.173	-832	2420	0.503	1588	0.330	1036	0.216	552	0.115
Aug.	6.20	6.00	2.94	-0.40	-0.004	1.75	1.91	1.83	1.965	-0.300	-0.304	-1461	2337	0.486	876	0.182	1041	0.217	165	-0.034
Sept.	5.80	5.61	2.59	-0.44	-0.005	1.42	1.58	1.50	1.665	-0.395	-0.400	-1923	2231	0.461	308	0.064	1036	0.216	728	-0.151
Oct.	5.36	5.12	1.96	-0.33	-0.004	0.96	1.12	1.04	1.270	-0.405	-0.409	-1966	2154	0.448	188	0.039	935	0.195	747	-0.155
Nov.	5.03	4.94	1.86	-0.12	-0.001	0.61	0.77	0.69	0.865	-0.255	-0.256	-1231	2093	0.435	862	0.179	850	0.177	12	0.002
Dec.																				
1868	4.91	4.88	1.64	-0.56	-0.006	0.45	0.61	0.53	0.610	-0.100	-0.106	-510	a2042	0.425	1532	0.319	801	0.167	731	0.152
Jan.	4.35	3.82	1.26	+0.13	+0.001	0.41	0.57	0.49	0.510	+0.320	+0.321	+1543	1733	0.361	3276	0.682	661	0.138	2615	0.544
Feb.	4.48	5.13	1.87	+0.78	+0.009	1.09	1.25	1.17	0.830	+0.290	+0.299	+1437	2179	0.453	3616	0.752	744	0.155	2872	0.597
Mar.	5.26	5.38	2.65	+0.38	+0.004	0.99	1.15	1.07	1.120	+0.090	+0.094	+452	2095	0.436	2547	0.530	783	0.163	1764	0.367
Apr.	5.64	5.90	3.19	+0.42	+0.005	1.27	1.43	1.35	1.210	+0.245	+0.250	+1202	2209	0.460	3411	0.710	907	0.189	2504	0.521
May	6.06	6.22	3.57	+0.10	+0.001	1.48	1.64	1.56	1.455	+0.120	+0.121	+582	2266	0.471	2848	0.592	891	0.185	1957	0.407
June	6.16	6.11	3.55	-0.22	-0.002	1.51	1.67	1.59	1.575	-0.155	-0.157	-755	2211	0.460	1456	0.303	951	0.198	505	0.105
July	5.94	5.78	3.07	-0.28	-0.003	1.17	1.33	1.25	1.420	-0.290	-0.293	-1408	2180	0.454	772	0.161	935	0.195	163	-0.034
Aug.	5.66	5.53	2.74	-0.34	-0.004	0.93	1.09	1.01	1.130	-0.235	-0.239	-1149	2146	0.446	997	0.207	951	0.198	46	0.010
Sept.	5.32	5.11	2.28	-0.34	-0.004	0.70	0.86	0.78	0.895	-0.150	-0.154	-740	2064	0.429	1324	0.275	944	0.196	380	0.079
Oct.	4.98	4.85	1.99	-0.18	-0.002	0.63	0.79	0.71	0.745	-0.175	-0.177	-851	2016	0.419	1165	0.242	979	0.204	186	0.039
Nov.	4.80	4.76	1.90	-0.21	-0.002	0.35	0.51	0.43	0.570	-0.190	-0.192	-923	1998	0.416	1075	0.224	868	0.181	207	0.043
Dec.																				
1869	4.59	4.42	1.87	-0.35	-0.004	0.25	0.41	0.33	0.380	-0.015	-0.019	-91	1844	0.384	1753	0.365	806	0.168	947	0.197
Jan.	4.24	4.06	1.80	-0.07	-0.001	0.32	0.48	0.40	0.365	-0.095	-0.096	-461	1692	0.352	1231	0.256	746	0.155	485	0.101
Feb.	4.17	4.28	2.30	+0.51	+0.006	0.06	0.22	0.14	0.270	+0.055	+0.061	+293	1607	0.334	1900	0.395	642	0.134	1258	0.262
Mar.	4.68	5.09	2.55	+0.49	+0.005	0.43	0.59	0.51	0.325	+0.350	+0.355	+1706	1976	0.411	3682	0.766	771	0.160	2911	0.606
Apr.	5.17	5.25	3.19	+0.36	+0.004	0.76	0.92	0.84	0.675	+0.430	+0.434	+2086	1848	0.384	3934	0.818	896	0.186	3038	0.632
May	5.53	5.81	3.57	+0.50	+0.006	1.29	1.45	1.37	1.105	+0.455	+0.461	+2216	2030	0.422	4246	0.883	903	0.188	3343	0.695
June	6.03	6.25	3.86	+0.23	+0.003	1.67	1.83	1.75	1.560	+0.320	+0.323	+1553	2184	0.454	3737	0.777	997	0.207	2740	0.570
July	6.26	6.26	3.80	-0.12	-0.001	1.93	2.09	2.01	1.880	+0.075	+0.074	+356	2241	0.460	2567	0.534	1105	0.230	1462	0.304
Aug.	6.14	6.03	3.47	-0.31	-0.004	1.82	1.98	1.90	1.955	-0.235	-0.239	-1149	2192	0.456	1043	0.217	1287	0.268	244	-0.051
Sept.	5.80	5.58	3.01	-0.36	-0.004	1.46	1.62	1.54	1.720	-0.240	-0.244	-1173	2091	0.435	918	0.191	1168	0.243	250	-0.052
Oct.	5.44	5.30	2.42	0.00	0.000	1.31	1.50	1.42	1.480	-0.200	-0.200	-961	2121	0.441	1160	0.241	1087	0.226	73	0.015
Nov.	5.44	5.59	2.89	+0.56	+0.006	1.06	1.22	1.14	1.280	-0.110	-0.104	-500	2133	0.444	1633	0.340	926	0.193	707	0.147
Dec.																				

a.—St. Clair River discharge used.

SESSIONAL PAPER No. 54.

1873	4.30	4.03	1.38	-0.12	-0.001	9.87	0.60	0.235	0.278	-0.040	-0.041	-197	1796	0.374	1599	0.333	771	0.160	828	0.172
Jan.	4.18	4.32	1.39	+0.32	+0.001	9.91	0.57	0.24	0.238	+0.097	+0.101	+485	1924	0.400	2410	0.501	732	0.152	1678	0.349
Feb.	1.50	4.69	1.48	+0.65	+0.007	580.22	0.61	0.13	0.335	+0.340	+0.317	+1668	2069	0.430	3737	0.777	737	0.153	3000	0.624
Mar.	5.15	5.61	2.71	+0.50	+0.006	0.79	1.05	0.92	0.675	+0.510	+0.516	+2180	a1991	0.114	4471	0.930	741	0.154	3730	0.776
Apr.	5.65	5.69	3.17	+0.18	+0.002	1.35	1.55	1.15	1.185	+0.523	+0.525	+2524	1997	0.115	4521	0.940	870	0.181	3651	0.759
May	5.83	5.97	3.51	+0.19	+0.002	1.98	1.95	1.965	1.708	+0.297	+0.299	+1437	2133	0.144	3570	0.743	900	0.187	2670	0.555
June	6.02	6.07	3.53	+0.05	+0.001	1.94	2.15	2.045	2.005	+0.067	+0.068	+327	2195	0.457	2522	0.525	1002	0.208	1520	0.316
July	6.07	6.07	3.51	-0.13	-0.001	2.04	2.16	2.10	2.072	-0.062	-0.063	-303	2201	0.458	1898	0.395	1059	0.220	839	0.175
Aug.	5.94	5.81	3.05	-0.28	-0.003	1.85	1.99	1.92	2.010	-0.112	-0.115	-553	2202	0.458	1649	0.343	1075	0.224	574	0.119
Sept.	5.66	5.52	2.74	-0.24	-0.003	1.79	1.96	1.875	1.898	-0.106	-0.109	-524	2141	0.445	1617	0.336	1048	0.218	569	0.119
Oct.	5.42	5.32	2.41	-0.02	0.000	1.56	1.86	1.71	1.792	-0.132	-0.132	-635	2134	0.444	1499	0.312	997	0.207	502	0.104
Nov.	5.40	5.47	2.90	-0.34	-0.004	1.52	1.70	1.61	1.600	-0.055	-0.059	-284	2067	0.430	1783	0.371	942	0.196	841	0.175
Dec.																				
1874	5.06	4.66	3.27	-0.69	-0.008	1.48	1.72	1.60	1.605	+0.103	+0.095	+457	1470	0.306	1927	0.401	815	0.170	1112	0.231
Jan.	4.37	4.08	3.32	+0.44	+0.005	1.77	1.86	1.815	1.708	+0.180	+0.185	+889	1053	0.219	1942	0.404	778	0.162	1164	0.242
Feb.	4.81	5.54	3.37	+0.86	+0.010	1.92	2.00	1.96	1.888	+0.010	+0.020	+96	1947	0.405	2043	0.425	753	0.157	1290	0.268
Mar.	5.67	5.80	3.49	+0.14	+0.002	1.82	1.85	1.835	1.898	-0.056	-0.054	-260	2053	0.427	1793	0.373	725	0.151	1068	0.222
Apr.	5.81	5.82	3.67	+0.12	+0.001	1.80	1.90	1.85	1.812	+0.186	+0.187	+899	1998	0.416	2897	0.603	822	0.171	2075	0.432
May	5.93	6.04	3.73	+0.17	+0.002	2.17	2.24	2.205	2.028	+0.200	+0.202	+971	2106	0.438	3077	0.640	921	0.192	2156	0.449
June	6.10	6.17	3.77	+0.03	0.000	2.10	2.40	2.25	2.228	-0.003	-0.003	-14	2168	0.451	2154	0.448	1006	0.209	1148	0.239
July	6.13	6.09	3.65	-0.16	-0.002	2.11	2.29	2.20	2.225	-0.133	-0.135	-649	2164	0.450	1515	0.315	1020	0.212	495	0.103
Aug.	5.97	5.85	3.13	-0.26	-0.003	1.86	2.11	1.985	2.092	-0.262	-0.265	-1274	2200	0.458	926	0.193	1016	0.211	90	-0.019
Sept.	5.71	5.57	2.68	-0.29	-0.003	1.51	1.84	1.675	1.830	-0.340	-0.343	-1649	2185	0.455	536	0.112	1045	0.217	509	-0.106
Oct.	5.42	5.27	2.13	-0.34	-0.004	1.31	1.30	1.305	1.490	-0.232	-0.236	-1134	2183	0.454	1049	0.218	995	0.207	54	0.011
Nov.	5.08	4.90	2.04	-0.27	-0.003	0.97	1.45	1.21	1.258	-0.170	-0.173	-832	2027	0.422	1195	0.249	972	0.202	223	0.046
Dec.																				
1875	4.81	4.72	1.79	-0.09	-0.001	0.77	1.16	0.965	1.088	-0.156	-0.157	-755	2008	0.418	1253	0.261	866	0.180	387	0.081
Jan.	4.72	4.71	1.62	+0.08	+0.001	0.70	1.10	0.90	0.932	-0.007	-0.006	-29	2045	0.425	2016	0.419	808	0.168	1208	0.251
Feb.	4.80	4.90	1.78	+0.12	+0.001	0.76	1.14	0.95	0.925	+0.163	+0.164	+788	2093	0.435	2881	0.599	799	0.166	2082	0.433
Mar.	4.92	4.95	2.13	+0.34	+0.004	1.12	1.33	1.225	1.088	+0.364	+0.368	+1769	2027	0.422	3796	0.790	856	0.178	2940	0.612
Apr.	5.26	5.58	2.69	+0.41	+0.005	1.68	1.68	1.68	1.452	+0.366	+0.371	+1783	2187	0.455	3970	0.826	928	0.193	3042	0.633
May	5.67	5.76	3.11	+0.19	+0.002	1.92	1.99	1.955	1.818	+0.177	+0.179	+860	2157	0.449	3017	0.628	997	0.207	2020	0.420
June	5.86	5.95	3.25	+0.06	+0.001	1.89	2.18	2.035	1.995	+0.075	+0.076	+365	2218	0.461	2583	0.537	1016	0.211	1567	0.326
July	5.92	5.89	3.28	-0.12	-0.001	2.06	2.15	2.105	2.070	+0.028	+0.027	+130	2175	0.452	2305	0.480	1020	0.212	1285	0.267
Aug.	5.80	5.71	3.08	-0.20	-0.002	1.99	2.19	2.09	2.098	-0.093	-0.095	-457	2140	0.445	1683	0.350	1085	0.226	598	0.124
Sept.	5.60	5.50	2.58	-0.20	-0.002	1.84	2.00	1.92	2.005	-0.165	-0.167	-803	2177	0.453	1374	0.286	1055	0.219	319	0.066
Oct.	5.40	5.31	2.30	-0.17	-0.002	1.63	1.89	1.76	1.840	-0.195	-0.197	-947	2158	0.449	1211	0.252	990	0.206	221	0.046
Nov.	5.23	5.15	2.64	-0.02	0.000	1.44	1.62	1.53	1.645	-0.097	-0.097	-466	1980	0.412	1514	0.315	861	0.179	653	0.136
Dec.																				
1876	5.21	5.27	2.58	+0.31	+0.003	1.39	1.74	1.565	1.548	+0.062	+0.065	+312	2060	0.429	2372	0.493	854	0.178	1518	0.316
Jan.	5.52	5.78	3.14	+0.66	+0.007	1.59	1.72	1.655	1.610	+0.160	+0.167	+803	2160	0.449	2963	0.616	843	0.175	2120	0.441
Feb.	6.18	6.59	3.81	+0.42	+0.005	1.92	1.85	1.885	1.770	+0.235	+0.240	+1154	a2188	0.455	3342	0.695	783	0.163	2559	0.532
Mar.	6.60	6.60	4.28	-0.08	-0.001	2.12	2.13	2.125	2.005	+0.425	+0.424	+2038	2240	0.466	4278	0.890	792	0.165	3486	0.725
Apr.	6.52	6.43	4.69	+0.36	+0.004	2.74	2.73	2.735	2.430	+0.530	+0.534	+2567	1955	0.407	4522	0.941	958	0.199	3564	0.741
May	6.88	7.33	4.79	+0.51	+0.006	3.15	3.22	3.185	2.960	+0.420	+0.426	+2048	2511	0.522	4559	0.948	1092	0.227	3467	0.721
June	7.39	7.45	4.69	-0.02	0.000	3.49	3.66	3.575	3.380	+0.162	+0.162	+779	2627	0.546	3406	0.709	1200	0.250	2206	0.459
July	7.37	7.29	4.43	-0.33	-0.004	3.42	3.60	3.51	3.542	-0.072	-0.076	-365	2618	0.545	2253	0.469	1211	0.252	1041	0.217
Aug.	7.04	6.79	4.20	-0.44	-0.005	3.37	3.49	3.43	3.470	-0.285	-0.290	-1394	2389	0.497	995	0.207	1218	0.253	223	-0.046
Sept.	6.60	6.42	3.66	-0.24	-0.003	2.79	3.09	2.94	3.185	-0.257	-0.260	-1250	2352	0.489	1102	0.229	1142	0.238	40	-0.008
Oct.	6.36	6.30	3.61	+0.34	+0.001	2.89	2.94	2.915	2.928	-0.178	-0.174	-836	2300	0.478	1464	0.305	1078	0.224	386	0.080
Nov.	6.70	7.09	3.39	+0.14	+0.002	2.42	2.75	2.585	2.750	-0.272	-0.270	-1298	a2283	0.475	985	0.205	965	0.201	20	0.005
Dec.																				

a.—St. Clair River discharge used.

SESSIONAL PAPER No. 54.

1880	5.01	5.13	2.76	-0.07	-0.001	0.80	1.05	0.925	0.902	-0.014	-0.015	-	72	1931	0.402	1859	0.387	550	0.114	1309	0.272
Jan.	4.94	4.74	2.80	+0.03	0.000	0.71	0.99	0.85	0.888	-0.030	-0.030	-	144	1709	0.356	1565	0.326	543	0.113	1022	0.213
Feb.	4.97	5.20	2.96	+0.33	+0.004	0.75	0.98	0.865	0.858	+0.052	+0.056	+269	1903	1903	0.396	2172	0.452	522	0.109	1650	0.343
Mar.	5.30	5.40	3.07	+0.22	+0.002	0.92	0.99	0.955	0.910	+0.230	+0.232	+1115	1974	1974	0.411	3089	0.643	525	0.109	2564	0.533
Apr.	5.52	5.64	3.43	+0.32	+0.004	1.26	1.39	1.325	1.140	+0.435	+0.439	+2110	1983	1983	0.413	4093	0.851	695	0.145	3398	0.707
May	5.84	6.04	3.53	+0.16	+0.002	1.77	1.88	1.825	1.575	+0.383	+0.385	+1851	2176	2176	0.453	4027	0.838	870	0.181	3157	0.657
June	6.00	5.96	3.63	0.00	0.000	1.99	2.19	2.09	1.958	+0.112	+0.112	+538	2095	2095	0.436	2633	0.518	926	0.193	1707	0.355
July	6.00	6.05	3.43	-0.09	-0.001	2.02	2.08	2.05	2.070	-0.122	-0.123	-591	2216	2216	0.461	1625	0.338	898	0.187	727	0.151
Aug.	5.91	5.77	3.14	-0.33	-0.004	1.72	1.97	1.845	1.948	-0.278	-0.282	-1356	2153	2153	0.448	797	0.166	935	0.195	-138	-0.029
Sept.	5.58	5.39	2.69	-0.28	-0.003	1.38	1.61	1.495	1.670	-0.285	-0.288	-1384	2089	2089	0.435	705	0.147	882	0.183	-177	-0.037
Oct.	5.30	5.21	2.48	+0.22	+0.002	1.06	1.49	1.275	1.385	-0.203	-0.201	-966	2058	2058	0.428	1092	0.227	889	0.185	203	0.042
Nov.	5.52	5.82	2.26	-0.50	-0.006	0.89	1.29	1.09	1.182	-0.122	-0.128	-615	2054	2054	0.427	1439	0.299	824	0.171	615	0.128
Dec.																					
1881	5.02	4.21	1.83	-0.56	-0.006	0.90	1.16	1.03	1.060	+0.120	+0.114	+548	1756	1756	0.365	2304	0.479	753	0.157	1551	0.332
Jan.	4.46	4.72	1.94	+0.28	+0.003	1.11	1.55	1.33	1.180	+0.225	+0.228	+1096	1968	1968	0.409	3064	0.637	730	0.152	2334	0.485
Feb.	4.74	4.76	2.28	+0.34	+0.004	1.40	1.56	1.48	1.405	+0.057	+0.061	+293	1891	1891	0.393	2184	0.454	734	0.153	1450	0.302
Mar.	5.08	5.41	2.93	+0.53	+0.006	1.31	1.58	1.445	1.462	+0.190	+0.196	+942	2025	2025	0.421	2967	0.617	709	0.147	2258	0.470
Apr.	5.61	5.81	3.42	+0.35	+0.004	1.82	1.90	1.86	1.652	+0.308	+0.312	+1500	2083	2083	0.433	3583	0.745	806	0.168	2777	0.577
May	5.96	6.12	3.65	+0.14	+0.002	2.05	2.07	2.06	1.960	+0.130	+0.132	+635	2182	2182	0.454	2816	0.586	859	0.179	1957	0.407
June	6.10	6.09	3.61	-0.06	-0.001	2.02	2.22	2.12	2.090	-0.012	-0.013	-62	2178	2178	0.453	2116	0.440	905	0.188	1211	0.252
July	6.04	5.98	3.33	-0.14	-0.002	2.02	2.05	2.035	2.078	-0.140	-0.142	-683	2209	2209	0.460	1526	0.317	886	0.184	640	0.133
Aug.	5.90	5.82	2.92	-0.20	-0.002	1.79	1.89	1.84	1.938	+0.047	+0.045	+216	2247	2247	0.467	2463	0.512	930	0.193	1533	0.319
Sept.	5.70	5.58	2.86	-0.06	-0.001	2.12	2.14	2.13	1.985	+0.135	+0.134	+644	2137	2137	0.445	2781	0.579	1036	0.216	1745	0.353
Oct.	5.64	5.70	2.55	+0.10	+0.001	1.95	2.27	2.11	2.120	-0.078	-0.077	-370	2288	2288	0.476	1918	0.399	1013	0.211	905	0.188
Nov.	5.74	5.77	2.88	+0.15	+0.002	1.85	2.10	1.975	2.042	-0.160	-0.158	-760	2232	2232	0.464	1472	0.306	937	0.195	535	0.111
Dec.																					
1882	5.89	6.01	3.33	-0.04	0.000	1.63	1.95	1.79	1.882	-0.152	-0.152	-731	2225	2225	0.463	1494	0.311	820	0.171	674	0.140
Jan.	5.85	5.69	3.33	+0.11	+0.001	1.62	1.72	1.67	1.730	+0.068	+0.069	+332	2045	2045	0.425	2377	0.494	769	0.160	1608	0.335
Feb.	5.96	6.23	3.80	+0.31	+0.003	1.99	1.86	1.925	1.798	+0.214	+0.217	+1043	2194	2194	0.456	3237	0.673	741	0.154	2496	0.519
Mar.	6.27	6.31	3.97	+0.28	+0.003	2.12	2.08	2.10	2.012	+0.156	+0.159	+764	2182	2182	0.454	2946	0.613	730	0.152	2216	0.461
Apr.	6.55	6.79	4.26	+0.15	+0.002	2.22	2.25	2.235	2.168	+0.192	+0.194	+933	2368	2368	0.493	3301	0.687	824	0.171	2477	0.515
May	6.70	6.62	4.40	+0.20	+0.002	2.49	2.48	2.485	2.360	+0.192	+0.194	+933	2206	2206	0.459	3139	0.653	845	0.176	2294	0.477
June	6.90	7.18	4.34	+0.28	+0.003	2.62	2.62	2.62	2.552	+0.130	+0.133	+639	2580	2580	0.537	3219	0.670	926	0.193	2293	0.477
July	7.18	7.18	4.24	-0.34	-0.004	2.81	2.68	2.745	2.682	+0.003	-0.001	-5	2615	2615	0.544	2610	0.543	949	0.197	1661	0.346
Aug.	6.84	6.51	3.91	-0.50	-0.006	2.69	2.56	2.625	2.685	-0.220	-0.226	-1086	2321	2321	0.483	1235	0.257	935	0.195	300	0.062
Sept.	6.34	6.16	3.45	-0.32	-0.004	2.28	2.33	2.305	2.465	-0.275	-0.279	-1341	2271	2271	0.472	930	0.193	914	0.190	16	0.003
Oct.	6.02	5.87	3.00	+0.07	+0.001	2.07	2.08	2.075	2.190	-0.235	-0.234	-1125	2251	2251	0.468	1126	0.234	900	0.187	226	0.047
Nov.	6.09	6.31	2.61	+0.01	0.000	1.74	1.93	1.835	1.955	-0.235	-0.235	-1130	22139	22139	0.445	1009	0.210	838	0.174	171	0.036
Dec.																					
1883	6.10	5.89	2.50	-0.32	-0.001	1.48	1.73	1.605	1.720	-0.118	-0.122	-586	2238	2238	0.466	1652	0.344	739	0.154	913	0.190
Jan.	5.78	5.67	2.71	-0.40	-0.004	1.52	1.68	1.60	1.602	+0.030	+0.026	+125	2228	2228	0.463	2353	0.489	718	0.149	1635	0.340
Feb.	5.38	5.09	2.92	+0.01	0.000	1.61	1.72	1.665	1.632	+0.088	+0.088	+423	1856	1856	0.386	2279	0.474	718	0.149	1561	0.325
Mar.	5.39	5.69	2.99	+0.53	+0.006	1.82	1.73	1.775	1.720	+0.318	+0.324	+1557	2156	2156	0.449	3713	0.772	734	0.153	2979	0.620
Apr.	5.92	6.14	3.54	+0.59	+0.007	2.30	2.30	2.30	2.038	+0.457	+0.464	+2230	2230	2230	0.464	4460	0.928	732	0.152	3728	0.776
May	6.51	6.88	4.23	+0.69	+0.008	2.66	2.72	2.69	2.495	+0.465	+0.473	+2274	2434	2434	0.506	4708	0.979	817	0.170	3891	0.809
June	7.20	7.51	4.44	+0.28	+0.003	3.26	3.20	3.23	2.960	+0.312	+0.315	+1524	2754	2754	0.573	4268	0.888	859	0.179	3409	0.709
July	7.48	7.44	4.42	-0.28	-0.003	3.23	3.40	3.315	3.272	-0.084	-0.087	-418	2716	2716	0.565	2298	0.478	956	0.199	1342	0.279
Aug.	7.20	6.95	4.05	-0.46	-0.005	3.04	3.08	3.06	3.188	-0.266	-0.271	-1303	2538	2538	0.528	1235	0.257	880	0.183	355	0.074
Sept.	6.74	6.54	3.72	-0.42	-0.005	2.82	2.75	2.785	2.922	-0.222	-0.227	-1091	2402	2402	0.500	1311	0.273	845	0.176	466	0.097
Oct.	6.32	6.09	3.21	-0.28	-0.003	2.37	2.86	2.615	2.700	-0.132	-0.135	-649	2307	2307	0.480	1658	0.345	820	0.171	838	0.174
Nov.	6.04	6.00	3.36	-0.77	-0.009	2.29	2.75	2.52	2.568	-0.150	-0.159	-764	2211	2211	0.460	1447	0.301	760	0.158	687	0.143
Dec.																					

a.—St. Clair River discharge used.

TABLE 25.—Continued. SUPPLY FACTORS OF LAKE MICHIGAN-HURON.

DATE	WATER LEVELS OF DETROIT RIVER.				STORAGE IN LAKE ST. CLAIR.		WATER LEVELS OF LAKE MICHIGAN-HURON.				STORAGE IN LAKE MICHIGAN-HURON AND LAKE ST. CLAIR.		OUTFLOW THROUGH DETROIT RIVLR.		TOTAL SUPPLY TO LAKE MICHIGAN-HURON.		INFLOW FROM ST. MARYS RIVER.		LOCAL SUPPLY TO LAKE MICHIGAN-HURON.		
	Windmill Point.		Ankerst. Point.		Foot Depth.	Equivalent Foot Depth, Lake Michigan-Huron.	Milwaukee Wis.	Harbor Mich.	Mean of Month.	Mean, Milwaukee and Harbor Beach.	Foot Depth, Lake Michigan-Huron.	100 c. f. s.	Ft. Depth Lake Michigan-Huron.	100 c. f. s.	100 c. f. s.	Foot Depth.	100 c. f. s.	Ft. Depth Lake Michigan-Huron.	100 c. f. s.	Foot Depth	
	First of Month.	Mean of Month.	First of Month.	Mean of Month.																	
1884																					
Jan.	5.75	27.574	54.573	01	-0.47	-0.005	582.07	582.56	315.582	418	-0.110	-0.115	0.315	1514	0.315	961	0.200	737	0.153	224	0.047
Feb.	4.80	5.05	3.27	+0.95	+0.011	+0.011	2.19	2.41	2.30	2.308	+0.064	+0.075	0.354	1703	0.354	2064	0.429	693	0.144	1371	0.285
Mar.	5.75	6.45	3.48	+0.84	+0.009	+0.009	2.44	2.45	2.445	2.372	+0.196	+0.205	0.505	2426	0.505	3411	0.710	672	0.140	2739	0.570
Apr.	6.59	6.73	3.98	+0.25	+0.003	+0.003	2.62	2.76	2.69	2.568	+0.230	+0.233	0.505	2428	0.505	3548	0.738	633	0.132	2915	0.066
May	6.84	6.96	4.34	+0.21	+0.002	+0.002	2.83	2.98	2.905	2.798	+0.162	+0.164	0.508	2444	0.508	3232	0.672	718	0.149	2514	0.523
June	7.05	7.14	4.41	+0.09	+0.001	+0.001	2.99	3.04	3.015	2.960	+0.035	+0.036	0.527	2531	0.527	2704	0.563	741	0.154	1963	0.408
July	7.14	7.15	4.20	-0.13	-0.001	-0.001	2.83	3.12	2.975	2.995	-0.085	-0.086	0.518	2611	0.518	2198	0.457	792	0.165	1406	0.292
Aug.	7.01	6.87	4.08	-0.33	-0.004	-0.004	2.69	3.00	2.845	2.910	-0.215	-0.219	0.501	2489	0.501	1436	0.299	801	0.167	635	0.132
Sept.	6.68	6.48	3.59	-0.33	-0.004	-0.004	2.44	2.65	2.545	2.695	-0.110	-0.114	0.492	2410	0.492	1862	0.387	817	0.170	1045	0.217
Oct.	6.35	6.22	3.25	-0.32	-0.004	-0.004	2.44	2.81	2.625	2.585	-0.137	-0.141	0.486	2367	0.486	1689	0.351	838	0.174	851	0.177
Nov.	6.03	5.84	2.64	-0.13	-0.001	-0.001	2.08	2.46	2.27	2.448	-0.250	-0.251	0.496	2336	0.496	1129	0.235	861	0.179	268	0.056
Dec.	5.90	5.96	2.69	+0.30	+0.003	+0.003	2.05	2.20	2.125	2.198	-0.003	0.000	0.496	2384	0.496	2384	0.496	801	0.167	1583	0.329
1885																					
Jan.	6.20	6.43	2.49	-0.14	-0.002	-0.002	2.06	2.47	2.265	2.195	+0.105	+0.103	0.499	2398	0.499	2893	0.602	762	0.159	2131	0.443
Feb.	6.06	5.69	2.28	+0.06	+0.001	+0.001	2.29	2.38	2.335	2.300	+0.025	+0.026	0.489	2352	0.489	2477	0.515	737	0.153	1740	0.362
Mar.	6.12	6.56	2.16	+0.47	+0.005	+0.005	2.25	2.38	2.315	2.325	+0.065	+0.070	0.492	2364	0.492	2700	0.562	704	0.146	1996	0.415
Apr.	6.59	6.62	2.93	-0.01	0.000	0.000	2.44	2.49	2.465	2.390	+0.265	+0.265	0.476	2287	0.476	3561	0.741	665	0.138	2896	0.602
May	6.58	6.53	3.75	+0.14	+0.002	+0.002	2.80	2.89	2.845	2.655	+0.315	+0.317	0.496	2386	0.496	3910	0.813	799	0.166	3111	0.647
June	6.72	6.91	4.25	+0.12	+0.001	+0.001	3.01	3.18	3.095	2.970	+0.162	+0.163	0.509	2445	0.509	3229	0.672	877	0.182	2352	0.489
July	6.84	6.78	4.22	0.00	0.000	0.000	3.10	3.24	3.17	3.132	+0.128	+0.128	0.494	2376	0.494	2991	0.622	919	0.191	2072	0.431
Aug.	6.84	6.90	4.27	-0.03	0.000	0.000	3.31	3.39	3.35	3.260	+0.030	+0.030	0.506	2432	0.506	2576	0.536	969	0.202	1607	0.334
Sept.	6.81	6.72	4.06	-0.27	-0.003	-0.003	3.17	3.29	3.23	3.290	-0.152	-0.155	0.498	2396	0.498	1651	0.343	914	0.190	737	0.153
Oct.	6.54	6.36	3.95	-0.20	-0.002	-0.002	3.03	3.06	3.045	3.138	-0.216	-0.218	0.461	2217	0.461	1169	0.243	873	0.182	296	0.062
Nov.	6.34	6.31	3.70	-0.07	-0.001	-0.001	2.73	2.87	2.80	2.922	-0.244	-0.245	0.473	2276	0.473	1098	0.228	856	0.178	242	0.050
Dec.	6.27	6.23	3.77	-0.47	-0.005	-0.005	2.44	2.67	2.555	2.678	-0.066	-0.071	0.458	2204	0.458	1863	0.388	787	0.164	1076	0.224
1886																					
Jan.	5.80	5.36	3.77	-0.86	-0.010	-0.010	2.67	2.67	2.67	2.612	+0.080	+0.070	0.349	1677	0.349	2013	0.419	707	0.147	1306	0.272
Feb.	4.94	4.53	3.04	0.00	0.000	0.000	2.69	2.74	2.715	2.692	+0.140	+0.140	0.310	1490	0.310	2163	0.450	670	0.139	1493	0.311
Mar.	4.94	5.34	2.87	+0.75	+0.008	+0.008	2.97	2.93	2.95	2.832	+0.258	+0.266	0.418	2008	0.418	3287	0.684	670	0.139	2617	0.544
Apr.	5.69	6.04	3.70	+0.73	+0.008	+0.008	3.24	3.22	3.23	3.090	+0.288	+0.296	0.441	2118	0.441	3541	0.737	665	0.138	2876	0.598
May	6.42	6.79	4.09	+0.40	+0.004	+0.004	3.50	3.55	3.525	3.378	+0.187	+0.191	0.505	2428	0.505	3346	0.696	776	0.161	2570	0.535
June	6.82	6.85	4.18	+0.02	0.000	0.000	3.57	3.64	3.605	3.565	-0.047	-0.047	0.506	2432	0.506	2206	0.459	813	0.169	1393	0.290
July	6.84	6.82	4.17	-0.08	-0.001	-0.001	3.38	3.48	3.43	3.518	-0.183	-0.184	0.503	2418	0.503	1534	0.319	852	0.177	682	0.142
Aug.	6.76	6.71	4.01	-0.14	-0.002	-0.002	3.15	3.33	3.24	3.335	-0.202	-0.202	0.501	2406	0.501	1435	0.299	884	0.184	551	0.115
Sept.	6.62	6.53	3.70	-0.19	-0.002	-0.002	2.91	3.15	3.03	3.135	-0.163	-0.165	0.500	2403	0.500	1610	0.335	852	0.177	758	0.158
Oct.	6.43	6.33	3.46	-0.27	-0.003	-0.003	2.81	3.02	2.915	2.972	-0.210	-0.213	0.492	2364	0.492	1340	0.279	859	0.179	481	0.100
Nov.	6.16	5.98	3.04	-0.08	-0.001	-0.001	2.47	2.75	2.61	2.762	-0.314	-0.315	0.478	2298	0.478	784	0.163	843	0.175	59	-0.012
Dec.	6.08	6.19	3.07	-0.06	-0.001	-0.001	2.14	2.43	2.285	2.448	-0.226	-0.227	0.500	2403	0.500	1312	0.273	744	0.155	568	0.118

SESSIONAL PAPER No. 54.

1887	6 02	5 85	2 83	-0 08	-0 001	2 06	2 26	2 16	2 222	+0 078	+0 077	+370	2289	0 476	2659	0 553	693	0 144	1966	0 409
Jan.	5 94	6 02	3 26	+0 10	+0 001	2 43	2 15	2 41	2 300	+0 232	+0 233	+1120	2253	0 169	3373	0 702	661	0 138	2712	0 564
Feb.	6 04	6 05	4 06	+0 13	+0 001	2 59	2 66	2 625	2 532	+0 058	+0 059	+284	1985	0 113	2269	0 472	654	0 136	1615	0 336
Mar.	6 17	6 29	4 06	+0 26	+0 003	2 54	2 57	2 555	2 590	+0 065	+0 068	+327	2133	0 144	2460	0 512	622	0 129	1838	0 382
April	6 43	6 57	4 33	+0 19	+0 002	2 74	2 77	2 755	2 655	+0 163	+0 165	+793	2202	0 158	2995	0 623	704	0 146	2291	0 477
May	6 62	6 67	4 34	+0 03	0 000	2 87	2 89	2 88	2 818	+0 067	+0 067	+322	2261	0 170	2583	0 537	808	0 168	1775	0 369
June	6 65	6 63	4 12	-0 11	-0 001	2 81	2 97	2 89	2 885	-0 083	-0 084	-404	2319	0 482	1915	0 398	893	0 186	1022	0 213
July	6 54	6 46	3 85	-0 24	-0 003	2 67	2 76	2 715	2 802	-0 260	-0 263	-1264	2316	0 482	1052	0 219	866	0 180	186	0 039
Aug.	6 30	6 15	3 55	-0 34	-0 004	2 33	2 41	2 37	2 542	-0 340	-0 344	-1654	2233	0 465	579	0 120	834	0 173	255	-0 053
Sept.	5 96	5 78	2 95	-0 40	-0 004	1 88	2 19	2 035	2 202	-0 362	-0 366	-1759	2217	0 461	458	0 095	875	0 182	417	-0 087
Oct.	5 56	5 35	2 55	-0 26	-0 003	1 55	1 74	1 645	1 840	-0 298	-0 301	-1447	2109	0 439	662	0 138	822	0 171	160	-0 033
Nov.	5 30	5 25	2 69	-0 04	0 000	1 43	1 45	1 44	1 542	-0 174	-0 174	-836	2016	0 419	1180	0 245	728	0 151	452	0 094
Dec.																				
1888	5 26	5 28	2 49	-0 06	-0 001	1 25	1 34	1 295	1 368	-0 108	-0 109	-524	2090	0 435	1566	0 326	691	0 144	875	0 182
Jan.	5 20	5 12	2 22	-0 21	-0 002	1 20	1 25	1 225	1 260	+0 052	+0 050	+240	2086	0 434	2326	0 484	612	0 127	1714	0 357
Feb.	4 99	4 86	2 34	+0 21	+0 002	1 38	1 42	1 40	1 312	+0 176	+0 178	+856	1922	0 400	2778	0 578	624	0 130	2154	0 448
Mar.	5 20	5 55	2 92	+0 39	+0 004	1 59	1 56	1 575	1 488	+0 292	+0 296	+1423	2104	0 438	3527	0 734	622	0 129	2905	0 604
April	5 59	5 63	3 26	+0 15	+0 002	1 97	2 00	1 985	1 780	+0 348	+0 350	+1682	2036	0 424	3718	0 773	760	0 158	2958	0 615
May	5 74	5 85	3 38	+0 24	+0 003	2 24	2 30	2 27	2 128	+0 152	+0 155	+745	2120	0 441	2865	0 596	956	0 199	1909	0 397
June	5 98	6 10	3 54	+0 08	+0 001	2 25	2 33	2 29	2 280	-0 010	-0 009	-43	2208	0 459	2165	0 450	992	0 206	1173	0 244
July	6 06	6 01	3 48	-0 18	-0 002	2 13	2 37	2 25	2 270	-0 130	-0 132	-635	2177	0 453	1542	0 321	990	0 206	552	0 115
Aug.	5 88	5 74	2 98	-0 30	-0 003	1 98	2 08	2 03	2 140	-0 248	-0 251	-1207	2186	0 455	979	0 204	972	0 202	7	0 001
Sept.	5 58	5 42	2 60	-0 23	-0 003	1 73	1 78	1 755	1 892	-0 194	-0 197	-947	2131	0 443	1184	0 246	969	0 202	215	0 045
Oct.	5 35	5 28	2 53	-0 15	-0 002	1 68	1 60	1 64	1 698	-0 256	-0 258	-1240	2079	0 432	839	0 175	923	0 192	84	-0 017
Nov.	5 20	5 11	2 53	+0 02	0 000	1 10	1 39	1 245	1 442	-0 237	-0 237	-1139	1992	0 414	853	0 177	778	0 162	75	0 016
Dec.																				
1889	5 22	5 32	2 53	-0 34	-0 001	1 08	1 25	1 165	1 205	-0 067	-0 071	-341	2099	0 437	1758	0 366	722	0 150	1036	0 216
Jan.	4 88	4 44	2 37	-0 47	-0 005	1 05	1 17	1 11	1 138	-0 038	-0 043	-207	1701	0 354	1494	0 311	664	0 138	830	0 173
Feb.	4 41	4 38	2 23	+0 14	+0 002	1 03	1 15	1 09	1 100	-0 025	-0 023	-111	1716	0 357	1605	0 334	670	0 139	935	0 195
Mar.	4 55	4 72	2 53	+0 39	+0 004	1 04	1 08	1 06	1 075	+0 040	+0 044	+212	1792	0 373	2004	0 417	668	0 139	1336	0 278
April	4 94	5 16	2 80	+0 50	+0 006	1 12	1 22	1 17	1 115	+0 253	+0 259	+1245	1934	0 402	3179	0 661	780	0 162	2399	0 499
May	5 44	5 72	3 22	+0 33	+0 004	1 58	1 55	1 565	1 368	+0 307	+0 311	+1495	2100	0 437	3595	0 748	816	0 170	2779	0 578
June	5 77	5 82	3 43	-0 02	0 000	1 76	1 81	1 785	1 675	+0 035	+0 035	+168	2086	0 434	2254	0 469	870	0 181	1384	0 288
July	5 75	5 68	3 16	-0 19	-0 002	1 52	1 75	1 635	1 710	-0 160	-0 162	-779	2097	0 436	1318	0 274	872	0 181	446	0 093
Aug.	5 56	5 45	2 71	-0 32	-0 004	1 35	1 58	1 465	1 550	-0 240	-0 244	-1173	2113	0 440	940	0 196	870	0 181	70	0 015
Sept.	5 24	5 02	2 28	-0 36	-0 004	1 10	1 21	1 155	1 310	-0 328	-0 332	-1596	2020	0 420	424	0 088	840	0 175	416	-0 087
Oct.	4 88	4 73	1 88	-0 22	-0 002	0 75	0 87	0 81	0 982	-0 257	-0 259	-1245	1988	0 414	743	0 155	780	0 162	37	-0 008
Nov.	4 66	4 60	2 26	+0 16	+0 002	0 57	0 71	0 64	0 725	-0 047	-0 045	-216	1817	0 378	1601	0 333	704	0 146	897	0 187
Dec.																				
1890	4 82	5 05	2 60	+0 18	+0 002	0 65	0 78	0 715	0 678	-0 003	-0 001	-5	1940	0 404	1935	0 403	714	0 149	1221	0 254
Jan.	5 00	4 96	2 89	-0 04	0 000	0 61	0 66	0 635	0 675	-0 050	-0 050	-240	1797	0 374	1557	0 324	604	0 126	953	0 198
Feb.	4 96	4 96	3 03	+0 22	+0 002	0 59	0 64	0 615	0 625	+0 105	+0 107	+514	1745	0 363	2259	0 470	602	0 125	1657	0 345
Mar.	5 18	5 39	3 47	+0 37	+0 001	0 91	0 78	0 845	0 730	+0 250	+0 254	+1221	1823	0 379	3044	0 633	588	0 122	2456	0 511
April	5 55	5 71	3 90	+0 38	+0 001	1 14	1 09	1 115	0 980	+0 315	+0 319	+1678	1839	0 383	3517	0 732	682	0 142	2835	0 590
May	5 93	6 15	4 26	+0 17	+0 002	1 55	1 52	1 535	1 325	+0 275	+0 277	+1332	1964	0 409	3296	0 686	798	0 166	2498	0 520
June	6 10	6 04	3 89	-0 18	-0 002	1 62	1 71	1 665	1 600	+0 045	+0 013	+207	2046	0 426	2253	0 469	870	0 181	1383	0 288
July	5 92	5 81	3 47	-0 24	-0 003	1 54	1 71	1 625	1 6 5	-0 137	-0 140	-673	2066	0 430	1393	0 290	852	0 177	541	0 113
Aug.	5 68	5 54	3 24	-0 27	-0 003	1 34	1 44	1 39	1 508	-0 198	-0 201	-966	1991	0 415	1028	0 214	830	0 173	198	0 041
Sept.	5 41	5 28	3 04	-0 15	-0 002	1 23	1 23	1 23	1 310	-0 215	-0 217	-1043	1919	0 399	876	0 182	816	0 170	60	0 012
Oct.	5 26	5 21	2 88	-0 12	-0 001	0 89	1 03	0 96	1 095	-0 297	-0 298	-1432	1950	0 406	518	0 108	788	0 164	270	-0 056
Nov.	5 14	5 03	2 77	-0 34	-0 001	0 54	0 73	0 635	0 798	-0 218	-0 222	-1067	1875	0 390	808	0 168	728	0 151	80	0 017
Dec.																				

a.—St. Clair River discharge used.

SESSIONAL PAPER No. 54.

1894	Jan.	4.61	4.60	2.06	-0.23	-0.003	0.26	0.23	0.245	0.255	0.000	-0.003	-	14	1876	0.390	1862	0.387	602	0.125	1260	0.262
	Feb.	4.38	4.16	1.94	-0.02	0.000	0.29	0.24	0.265	0.255	+0.113	+0.113	+	543	1698	0.353	2241	0.466	587	0.122	1654	0.344
	Mar.	4.36	4.56	1.99	+0.30	+0.003	0.55	0.39	0.47	0.368	+0.197	+0.200	+	961	1877	0.390	2838	0.590	566	0.118	2272	0.473
	April	4.66	4.75	2.34	+0.34	+0.001	0.70	0.62	0.66	0.565	+0.330	+0.334	+	1606	1867	0.388	3473	0.722	638	0.133	2835	0.590
	May	5.00	5.26	2.82	+0.38	+0.001	1.24	1.02	1.13	0.895	+0.350	+0.354	+	1702	1981	0.412	3683	0.766	822	0.171	2861	0.595
	June	5.38	5.50	3.02	+0.12	+0.001	1.40	1.32	1.36	1.245	+0.160	+0.161	+	774	2045	0.425	2819	0.586	868	0.181	1951	0.406
	July	5.50	5.50	3.01	-0.10	-0.001	1.43	1.47	1.45	1.405	-0.043	-0.044	-	212	2048	0.426	1836	0.382	894	0.186	942	0.196
	Aug.	5.40	5.31	2.68	-0.18	-0.002	1.35	1.20	1.275	1.362	-0.242	-0.244	-	1173	2051	0.427	878	0.183	896	0.186	18	-0.004
	Sept.	5.22	5.13	2.45	-0.24	-0.003	0.92	1.01	0.965	1.120	-0.268	-0.271	-	1303	2026	0.421	723	0.150	871	0.181	148	-0.031
	Oct.	4.98	4.83	2.12	-0.28	-0.003	0.71	0.77	0.74	0.852	-0.227	-0.230	-	1106	1971	0.410	865	0.180	879	0.183	14	-0.003
	Nov.	4.70	4.58	1.75	-0.18	-0.002	0.44	0.58	0.51	0.625	-0.277	-0.279	-	1341	1952	0.406	611	0.127	860	0.179	249	-0.052
	Dec.	4.52	4.46	1.80	+0.16	+0.002	0.09	0.28	0.185	0.348	-0.288	-0.286	-	1375	1882	0.392	507	0.105	804	0.167	297	-0.062
1895	Jan.	4.68	4.89	1.45	+0.24	+0.003	579.91	579.96	579.935	0.060	-0.182	-0.179	-	860	a1878	0.391	1018	0.212	747	0.155	271	0.056
	Feb.	4.92	4.96	1.22	-0.24	-0.003	9.80	9.84	9.82	579.878	-0.063	-0.066	-	317	a1842	0.383	1525	0.317	721	0.150	804	0.167
	Mar.	4.68	4.39	1.25	-0.52	-0.006	9.77	9.85	9.81	9.815	+0.070	+0.064	+	308	1988	0.414	2296	0.478	683	0.142	1613	0.336
	April	4.16	3.93	1.45	-0.05	-0.001	9.97	9.95	9.96	9.885	+0.157	+0.156	+	750	1732	0.360	2482	0.516	679	0.141	1803	0.375
	May	4.11	4.29	1.76	+0.25	+0.003	580.13	580.12	580.125	580.042	+0.113	+0.116	+	558	1814	0.377	2372	0.493	755	0.157	1617	0.336
	June	4.36	4.44	1.84	+0.09	+0.001	0.18	0.19	0.185	0.155	-0.005	-0.004	-	19	1861	0.387	1842	0.383	828	0.172	1014	0.211
	July	4.45	4.46	1.74	-0.01	0.000	0.07	0.16	0.115	0.150	-0.088	-0.088	-	423	1898	0.395	1475	0.307	873	0.182	602	0.125
	Aug.	4.44	4.43	1.70	-0.08	-0.001	579.95	0.07	0.01	0.062	-0.152	-0.153	-	735	1895	0.394	1160	0.241	875	0.182	285	0.059
	Sept.	4.36	4.28	1.54	-0.30	-0.003	9.68	579.94	579.81	579.910	-0.265	-0.268	-	1288	1868	0.389	580	0.121	907	0.189	327	-0.068
	Oct.	4.06	3.84	1.05	-0.37	-0.004	9.31	9.65	9.48	9.645	-0.317	-0.321	-	1543	1794	0.373	251	0.052	930	0.193	679	-0.141
	Nov.	3.69	3.54	0.82	-0.04	0.000	9.09	9.26	9.175	9.328	-0.240	-0.240	-	1154	1722	0.358	568	0.118	832	0.173	264	-0.055
	Dec.	3.65	3.76	1.10	+0.12	+0.001	8.98	9.02	9.00	9.088	-0.050	-0.049	-	236	1748	0.364	1512	0.315	830	0.173	682	0.142
1896	Jan.	3.77	3.78	1.15	-0.38	-0.004	9.06	9.09	9.075	9.038	+0.077	+0.073	+	351	1736	0.361	2087	0.434	727	0.151	1360	0.283
	Feb.	3.39	3.00	1.10	-0.25	-0.003	9.10	9.21	9.155	9.115	+0.017	+0.014	+	67	1410	0.293	1477	0.307	687	0.143	790	0.164
	Mar.	3.14	3.27	1.07	+0.41	+0.005	9.11	9.11	9.11	9.132	+0.030	+0.035	+	168	1540	0.320	1708	0.355	649	0.135	1059	0.220
	April	3.55	3.83	1.47	+0.43	+0.005	9.29	9.14	9.215	9.162	+0.223	+0.228	+	1096	1681	0.350	2777	0.578	701	0.146	2076	0.432
	May	3.98	4.14	1.94	+0.34	+0.004	9.57	9.54	9.555	9.385	+0.343	+0.347	+	1668	1688	0.351	3356	0.698	816	0.170	2540	0.528
	June	4.32	4.51	2.20	+0.26	+0.003	9.89	9.91	9.90	9.728	+0.172	+0.175	+	841	1791	0.373	2632	0.548	893	0.186	1739	0.362
	July	4.58	4.64	3.09	+0.14	+0.002	9.83	9.97	9.90	9.900	-0.008	-0.006	-	29	1888	0.393	1859	0.387	918	0.191	941	0.196
	Aug.	4.72	4.81	2.34	-0.08	-0.001	9.76	580.01	9.885	9.892	-0.077	-0.078	-	375	1898	0.395	1523	0.317	921	0.192	602	0.125
	Sept.	4.64	4.46	1.96	-0.25	-0.003	9.66	579.83	9.745	9.815	-0.133	-0.136	-	654	1837	0.382	1183	0.246	897	0.187	286	0.059
	Oct.	4.39	4.32	1.71	-0.31	-0.003	9.61	9.63	9.62	9.682	-0.152	-0.155	-	745	1842	0.383	1097	0.228	816	0.170	281	0.058
	Nov.	4.08	3.85	2.21	-0.27	-0.003	9.39	9.49	9.44	9.530	-0.130	-0.133	-	639	1840	0.383	1201	0.250	822	0.171	379	0.079
	Dec.	3.81	3.77	1.36	+0.21	+0.002	9.34	9.38	9.36	9.400	-0.025	-0.023	-	111	1683	0.350	1572	0.327	810	0.169	762	0.159
1897	Jan.	4.02	4.28	1.31	+0.44	+0.005	9.33	9.45	9.39	9.375	+0.013	+0.018	+	86	1925	0.400	2011	0.418	767	0.160	1244	0.259
	Feb.	4.46	4.64	1.51	+0.14	+0.002	9.41	9.36	9.385	9.388	+0.102	+0.104	+	500	a1784	0.371	2284	0.475	709	0.147	1575	0.328
	Mar.	4.60	4.57	1.90	+0.06	+0.001	9.72	9.47	9.595	9.490	+0.240	+0.241	+	1158	1907	0.397	3065	0.638	712	0.148	2353	0.489
	April	4.66	4.75	2.40	+0.32	+0.004	9.89	9.84	9.865	9.730	+0.400	+0.404	+	1942	1819	0.385	3791	0.789	737	0.163	3054	0.635
	May	4.98	5.20	2.82	+0.18	+0.002	580.38	580.41	580.395	580.130	+0.392	+0.394	+	1894	1950	0.406	3844	0.800	803	0.167	3041	0.633
	June	5.16	5.11	2.91	0.00	0.000	0.65	0.65	0.65	0.522	+0.220	+0.220	+	1058	1871	0.389	2929	0.609	871	0.181	2058	0.428
	July	5.16	5.22	2.91	+0.02	0.000	0.84	0.83	0.835	0.742	+0.080	+0.080	+	385	1931	0.402	2316	0.482	912	0.190	1404	0.292
	Aug.	5.18	5.15	2.79	-0.14	-0.002	0.78	0.81	0.822	0.822	-0.140	-0.142	-	683	1932	0.402	1249	0.260	942	0.196	307	0.064
	Sept.	5.04	4.93	2.45	-0.28	-0.003	0.53	0.58	0.555	0.682	-0.287	-0.290	-	1394	1926	0.401	532	0.111	910	0.198	378	-0.079
	Oct.	4.76	4.58	1.95	-0.21	-0.003	0.24	0.23	0.235	0.395	-0.265	-0.268	-	1288	1898	0.395	610	0.127	871	0.181	261	-0.051
	Nov.	4.52	4.47	1.69	-0.14	-0.002	579.98	0.07	0.025	0.130	-0.225	-0.227	-	1091	1916	0.399	825	0.172	850	0.177	25	-0.005
	Dec.	4.38	4.29	1.78	-0.14	-0.002	9.76	579.81	579.785	579.905	-0.167	-0.169	-	812	1807	0.376	995	0.207	758	0.158	237	0.019

a.—Lake St. Clair discharge used.

Table 25.—Continued. SUPPLY FACTORS OF LAKE MICHIGAN-HURON.

DATE	WATER LEVELS OF DETROIT RIVER.				STORAGE IN LAKE ST. CLAIR.		WATER LEVELS OF LAKE MICHIGAN-HURON.				STORAGE IN LAKE MICHIGAN-HURON.		OUTFLOW THROUGH DETROIT RIVER.		OUTFLOW THROUGH CHICAGO DRAINAGE CANAL.		TOTAL SUPPLY TO LAKE MICHIGAN-HURON.		INFLOW FROM ST. MARYS RIVER.		LOCAL SUPPLY TO LAKE MICHIGAN-HURON.											
	Windmill Point.	Ankerst. Burg, Ont.	Mean of Month.	Mean of Month.	Foot Depth.	Equivalent Foot Depth, Lake Michigan-Huron.	Mean of Month.	Mean of Month.	Mean of Month.	Mean of Month.	Foot Depth.	Foot Depth.	100 c. f. s.	100 c. f. s.	100 c. f. s.	100 c. f. s.	100 c. f. s.	100 c. f. s.	100 c. f. s.	100 c. f. s.	Foot Depth.											
																						First of Month.	First of Month.	First of Month.	First of Month.	Foot Depth.	Foot Depth.	100 c. f. s.	100 c. f. s.	100 c. f. s.	100 c. f. s.	Foot Depth.
1898	574	24 574	20 571	81	-0 26	-0 003	579	72 579	66 579	69	579	738	+0 002	-0 001	-	5	1756	0 365	0 365	0 365	0 365	0 365	0 365									
Jan.	3 98	3 77	2 01	+0 28	+0 003	9 86	9 72	9 79	9 740	+0 188	+0 191	+0 191	+0 191	+0 191	+0 191	+0 191	918	1482	0 308	0 308	0 308	0 308	0 308									
Feb.	4 26	4 76	2 29	+0 62	+0 007	580 18	9 95	580 065	9 928	+0 340	+0 347	+0 347	+0 347	+0 347	+0 347	+0 347	+1668	1888	0 393	0 393	0 393	0 393	0 393									
Mar.	4 88	5 01	2 82	+0 18	+0 002	0 50	580 44	0 47	580 268	+0 302	+0 304	+0 304	+0 304	+0 304	+0 304	+0 304	+1461	1818	0 384	0 384	0 384	0 384	0 384									
April	5 06	5 11	3 06	+0 12	+0 001	0 78	0 56	0 67	0 570	+0 172	+0 173	+0 173	+0 173	+0 173	+0 173	+0 173	+ 832	1818	0 378	0 378	0 378	0 378	0 378									
May	5 18	5 26	3 08	+0 10	+0 001	0 91	0 72	0 815	0 742	+0 093	+0 094	+0 094	+0 094	+0 094	+0 094	+0 094	+ 452	1893	0 394	0 394	0 394	0 394	0 394									
June	5 28	5 30	2 87	-0 08	-0 001	0 89	0 82	0 855	0 835	-0 057	-0 058	-0 058	-0 058	-0 058	-0 058	-0 058	- 279	1986	0 413	0 413	0 413	0 413	0 413									
July	5 20	5 10	2 71	-0 20	-0 002	0 69	0 71	0 70	0 778	-0 213	-0 215	-0 215	-0 215	-0 215	-0 215	-0 215	-1034	1931	0 402	0 402	0 402	0 402	0 402									
Aug.	5 00	4 90	2 27	-0 23	-0 003	0 34	0 52	0 43	0 565	-0 215	-0 218	-0 218	-0 218	-0 218	-0 218	-0 218	-1048	1964	0 409	0 409	0 409	0 409	0 409									
Sept.	4 77	4 64	2 06	-0 13	-0 001	0 33	0 21	0 27	0 350	-0 202	-0 203	-0 203	-0 203	-0 203	-0 203	-0 203	- 976	1896	0 394	0 394	0 394	0 394	0 394									
Oct.	4 64	4 65	1 81	+0 02	0 000	579 92	0 13	0 025	0 148	-0 256	-0 256	-0 256	-0 256	-0 256	-0 256	-0 256	-1231	1969	0 410	0 410	0 410	0 410	0 410									
Nov.	4 66	4 68	1 76	0 00	0 000	9 58	579 94	579 76	579 892	-0 210	-0 210	-0 210	-0 210	-0 210	-0 210	-0 210	-1009	1996	0 415	0 415	0 415	0 415	0 415									
Dec.	4 66	4 68	1 76	0 00	0 000	9 58	579 94	579 76	579 892	-0 210	-0 210	-0 210	-0 210	-0 210	-0 210	-0 210	-1009	1996	0 415	0 415	0 415	0 415	0 415									
1899	4 66	4 65	1 89	-0 05	-0 001	9 53	9 68	9 605	9 682	-0 092	-0 093	-0 093	-0 093	-0 093	-0 093	-0 093	- 447	1947	0 405	0 405	0 405	0 405	0 405									
Jan.	4 61	4 57	1 68	-0 53	-0 006	9 61	9 54	9 575	9 590	+0 072	+0 066	+0 066	+0 066	+0 066	+0 066	+0 066	+ 317	1856	0 386	0 386	0 386	0 386	0 386									
Feb.	4 08	3 59	2 07	-0 12	-0 001	9 81	9 69	9 75	9 662	+0 198	+0 197	+0 197	+0 197	+0 197	+0 197	+0 197	+ 947	1366	0 284	0 284	0 284	0 284	0 284									
Mar.	3 96	4 32	2 32	+0 64	+0 007	580 08	9 86	9 97	9 860	+0 355	+0 362	+0 362	+0 362	+0 362	+0 362	+0 362	+1740	1655	0 344	0 344	0 344	0 344	0 344									
April	4 60	4 88	2 72	+0 43	+0 005	0 52	580 46	580 46	580 215	+0 420	+0 425	+0 425	+0 425	+0 425	+0 425	+0 425	+2043	1812	0 377	0 377	0 377	0 377	0 377									
May	5 03	5 18	2 83	+0 21	+0 002	0 83	0 79	0 81	0 635	+0 300	+0 302	+0 302	+0 302	+0 302	+0 302	+0 302	+1452	1935	0 403	0 403	0 403	0 403	0 403									
June	5 24	5 30	2 76	+0 02	0 000	1 04	1 08	1 06	0 935	+0 083	+0 083	+0 083	+0 083	+0 083	+0 083	+0 083	+ 399	2022	0 421	0 421	0 421	0 421	0 421									
July	5 26	5 22	2 59	-0 18	-0 002	0 96	0 99	0 975	1 018	-0 128	-0 130	-0 130	-0 130	-0 130	-0 130	-0 130	- 625	2031	0 423	0 423	0 423	0 423	0 423									
Aug.	5 08	4 93	2 14	+0 71	+0 008	0 82	0 79	0 805	0 890	-0 270	-0 262	-0 262	-0 262	-0 262	-0 262	-0 262	-1259	2015	0 419	0 419	0 419	0 419	0 419									
Sept.	5 79	4 65	1 98	-1 22	-0 014	0 49	0 38	0 435	0 620	-0 265	-0 279	-0 279	-0 279	-0 279	-0 279	-0 279	-1341	1923	0 400	0 400	0 400	0 400	0 400									
Oct.	4 57	4 49	1 85	-0 27	-0 003	0 31	0 24	0 275	0 355	-0 253	-0 256	-0 256	-0 256	-0 256	-0 256	-0 256	-1231	1883	0 392	0 392	0 392	0 392	0 392									
Nov.	4 30	4 10	1 40	-0 24	-0 003	579 81	0 05	579 93	0 102	-0 267	-0 270	-0 270	-0 270	-0 270	-0 270	-0 270	-1298	1822	0 379	0 379	0 379	0 379	0 379									
Dec.	4 30	4 10	1 40	-0 24	-0 003	579 81	0 05	579 93	0 102	-0 267	-0 270	-0 270	-0 270	-0 270	-0 270	-0 270	-1298	1822	0 379	0 379	0 379	0 379	0 379									
1900	4 06	4 03	1 60	+0 08	+0 001	9 66	579 82	9 74	579 835	-0 065	-0 064	-0 064	-0 064	-0 064	-0 064	-0 064	- 308	1736	0 361	0 361	0 361	0 361	0 361									
Jan.	4 14	4 24	1 80	+0 32	+0 004	9 77	9 83	9 80	9 770	+0 080	+0 084	+0 084	+0 084	+0 084	+0 084	+0 084	+ 404	1778	0 370	0 370	0 370	0 370	0 370									
Feb.	4 46	4 67	2 19	+0 20	+0 002	9 94	9 86	9 90	9 850	+0 112	+0 114	+0 114	+0 114	+0 114	+0 114	+0 114	+ 548	1874	0 390	0 390	0 390	0 390	0 390									
Mar.	4 66	4 64	2 44	+0 06	+0 001	580 07	9 98	580 025	9 962	+0 160	+0 161	+0 161	+0 161	+0 161	+0 161	+0 161	+ 774	1780	0 370	0 370	0 370	0 370	0 370									
April	4 72	4 79	2 63	+0 17	+0 002	0 31	580 13	0 22	580 122	+0 168	+0 170	+0 170	+0 170	+0 170	+0 170	+0 170	+ 817	1796	0 374	0 374	0 374	0 374	0 374									
May	4 89	4 99	2 73	+0 11	+0 001	0 42	0 30	0 36	0 290	+0 160	+0 161	+0 161	+0 161	+0 161	+0 161	+0 161	+ 774	1868	0 389	0 389	0 389	0 389	0 389									
June	5 00	5 01	2 56	+0 04	0 000	0 53	0 55	0 54	0 450	+0 155	+0 155	+0 155	+0 155	+0 155	+0 155	+0 155	+ 745	1932	0 402	0 402	0 402	0 402	0 402									
July	5 04	5 06	2 56	-0 06	-0 001	0 70	0 64	0 67	0 605	+0 073	+0 072	+0 072	+0 072	+0 072	+0 072	+0 072	+ 346	1957	0 407	0 407	0 407	0 407	0 407									
Aug.	4 98	4 89	2 20	-0 16	-0 002	0 65	0 72	0 685	0 678	-0 006	-0 008	-0 008	-0 008	-0 008	-0 008	-0 008	- 38	1978	0 411	0 411	0 411	0 411	0 411									
Sept.	4 82	4 74	2 03	-0 19	-0 002	0 66	0 66	0 66	0 672	-0 047	-0 049	-0 049	-0 049	-0 049	-0 049	-0 049	- 236	1953	0 406													

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1901	4.21	4.01	1.63	-0.67	-0.007	579.95	0.22	0.085	0.205	-0.163	-0.170	-817	1719	0.358	49	0.010	951	0.198	818	0.170	133	0.028
Jan.	3.54	3.06	1.19	-0.35	-0.004	9.92	0.08	0.00	0.042	+0.060	+0.056	+269	1410	0.293	51	0.011	1730	0.360	764	0.159	966	0.201
Feb.	3.19	3.32	1.12	-0.19	-0.002	580.31	0.07	0.205	0.102	+0.260	+0.258	+1240	1548	0.322	53	0.011	2841	0.591	725	0.151	2116	0.440
April	3.00	2.69	1.39	+0.32	+0.004	0.49	0.55	0.52	0.362	+0.330	+0.334	+1606	1161	0.241	44	0.009	2811	0.585	745	0.155	2066	0.430
May	3.32	3.94	1.56	+1.06	+0.012	0.92	0.81	0.865	0.692	+0.210	+0.222	+1067	1706	0.355	31	0.006	2804	0.583	798	0.166	2006	0.417
June	4.38	4.81	2.03	+0.54	+0.006	0.97	0.91	0.94	0.902	+0.098	+0.104	+500	1986	0.413	29	0.006	2515	0.523	814	0.169	1701	0.354
July	4.92	5.04	2.20	+0.14	+0.002	1.06	1.06	1.06	1.000	+0.085	+0.087	+418	2052	0.427	31	0.006	2501	0.520	888	0.185	1613	0.336
Aug.	5.06	5.07	2.14	-0.08	-0.001	1.11	1.11	1.11	1.085	-0.080	-0.081	-389	2084	0.434	39	0.008	1734	0.361	920	0.191	814	0.169
Sept.	4.98	4.89	2.03	-0.26	-0.003	0.92	0.88	0.90	1.005	-0.250	-0.253	-1216	2025	0.421	39	0.008	848	0.176	896	0.186	47	-0.010
Oct.	4.72	4.56	1.59	-0.29	-0.003	0.56	0.66	0.61	0.755	-0.285	-0.288	-1384	1983	0.413	38	0.008	637	0.133	798	0.166	161	-0.033
Nov.	4.43	4.30	1.19	-0.05	-0.001	0.23	0.43	0.33	0.470	-0.292	-0.293	-1408	1963	0.408	39	0.008	594	0.124	788	0.164	194	-0.040
Dec.	4.38	4.47	1.62	-0.49	-0.005	579.95	0.10	0.025	0.178	-0.226	-0.231	-1110	1935	0.403	41	0.009	866	0.180	728	0.151	138	0.029
1902																						
Jan.	3.89	3.31	1.20	-0.75	-0.008	9.76	580.00	579.88	579.952	-0.157	-0.165	-793	1522	0.317	42	0.009	771	0.160	670	0.139	101	0.021
Feb.	3.14	2.96	0.86	+0.32	+0.004	9.61	579.81	9.71	9.795	-0.047	-0.043	-207	1464	0.305	42	0.009	1299	0.271	625	0.130	674	0.140
Mar.	3.46	3.96	1.13	+0.63	+0.007	9.84	9.73	9.785	9.748	+0.100	+0.107	+514	1827	0.380	42	0.009	2383	0.496	613	0.128	1770	0.368
April	4.09	4.22	1.63	+0.27	+0.003	9.91	9.91	9.91	9.848	+0.222	+0.225	+1082	1816	0.378	42	0.009	2940	0.612	638	0.133	2302	0.479
May	4.36	4.50	2.09	+0.33	+0.004	580.30	580.16	580.23	580.070	+0.290	+0.294	+1413	1818	0.378	42	0.009	3273	0.681	667	0.139	2606	0.542
June	4.69	4.88	2.33	+0.50	+0.006	0.50	0.48	0.49	0.360	+0.282	+0.288	+1384	1936	0.403	41	0.009	3361	0.699	725	0.151	2636	0.548
July	5.19	5.50	2.99	+0.27	+0.003	0.83	0.76	0.795	0.642	+0.176	+0.179	+860	2054	0.427	43	0.009	2957	0.615	760	0.158	2197	0.457
Aug.	5.46	5.41	3.00	-0.22	-0.002	0.85	0.83	0.84	0.818	-0.150	-0.152	-731	2003	0.417	42	0.009	1314	0.273	762	0.159	552	0.115
Sept.	5.24	5.08	2.64	-0.24	-0.003	0.48	0.51	0.495	0.668	-0.270	-0.273	-1312	1944	0.404	43	0.009	675	0.140	770	0.160	95	-0.020
Oct.	5.00	4.92	2.50	-0.23	-0.003	0.33	0.27	0.30	0.398	-0.156	-0.159	-764	1905	0.396	42	0.009	1183	0.246	746	0.155	437	0.091
Nov.	4.77	4.62	2.20	-0.14	-0.002	0.20	0.17	0.185	0.242	-0.190	-0.192	-923	1846	0.384	42	0.009	965	0.201	757	0.157	208	0.043
Dec.	4.63	4.64	1.98	+0.03	0.000	579.91	579.93	579.92	0.052	-0.234	-0.234	-1125	1919	0.399	54	0.011	848	0.176	731	0.152	117	0.024
1903																						
Jan.	4.66	4.69	1.81	-0.12	-0.001	9.69	9.74	9.715	579.818	-0.053	-0.054	-260	1988	0.414	61	0.013	1789	0.368	660	0.137	1129	0.235
Feb.	4.54	4.40	1.81	+0.04	0.000	9.85	9.78	9.815	9.765	+0.137	+0.137	+659	1851	0.385	57	0.012	2567	0.534	624	0.130	1943	0.404
Mar.	4.58	4.75	2.44	+0.45	+0.005	580.06	9.92	9.99	9.902	+0.243	+0.248	+1192	1837	0.382	53	0.011	3082	0.641	610	0.127	2472	0.514
April	5.03	5.31	3.20	+0.26	+0.003	0.33	580.27	580.30	580.145	+0.210	+0.213	+1024	1879	0.391	46	0.010	2949	0.613	649	0.135	2300	0.478
May	5.29	5.27	3.34	+0.03	0.000	0.43	0.39	0.41	0.355	+0.143	+0.143	+687	1803	0.375	46	0.010	2536	0.528	709	0.147	1827	0.380
June	5.32	5.38	3.22	+0.09	+0.001	0.61	0.56	0.585	0.498	+0.180	+0.181	+870	1911	0.398	48	0.010	2829	0.589	774	0.161	2055	0.428
July	5.41	5.44	3.18	-0.01	0.000	0.79	0.75	0.77	0.678	+0.070	+0.070	+336	1958	0.407	49	0.010	2343	0.487	795	0.165	1548	0.322
Aug.	5.40	5.36	2.99	-0.08	-0.001	0.72	0.73	0.725	0.748	+0.007	+0.006	+29	1978	0.411	45	0.009	2052	0.427	810	0.169	1242	0.258
Sept.	5.32	5.29	2.82	-0.16	-0.002	0.77	0.80	0.785	0.755	-0.030	-0.032	-154	1997	0.415	43	0.009	1886	0.392	813	0.169	1073	0.223
Oct.	5.16	5.04	2.39	-0.37	-0.004	0.50	0.83	0.665	0.725	-0.255	-0.259	-1245	1999	0.416	45	0.009	799	0.166	838	0.174	39	-0.008
Nov.	4.79	4.54	1.84	-0.05	-0.001	0.14	0.41	0.275	0.470	-0.332	-0.333	-1601	1910	0.397	47	0.010	356	0.074	818	0.170	462	-0.096
Dec.	4.74	4.94	1.67	-0.40	-0.004	579.88	0.12	0.00	0.138	-0.186	-0.190	-913	2138	0.445	56	0.012	1281	0.266	750	0.156	531	0.110
1904																						
Jan.	4.34	3.74	1.56	-0.51	-0.006	9.90	579.91	579.905	579.952	-0.057	-0.063	-303	1612	0.335	55	0.011	1364	0.281	666	0.139	698	0.145
Feb.	3.83	3.92	1.61	+0.59	+0.007	9.86	9.91	9.885	9.895	+0.103	+0.096	+461	1682	0.350	52	0.011	2195	0.457	630	0.131	1565	0.326
Mar.	4.42	4.92	2.20	+0.86	+0.010	580.14	580.08	580.11	9.998	+0.364	+0.374	+1798	1825	0.380	55	0.011	3678	0.765	593	0.123	3085	0.642
April	5.28	5.64	3.28	+0.34	+0.004	0.60	0.63	0.615	580.362	+0.423	+0.427	+2053	2035	0.423	49	0.010	4137	0.861	649	0.135	3488	0.726
May	5.62	5.61	3.60	+0.14	+0.002	0.95	0.96	0.955	0.785	+0.385	+0.387	+1860	1902	0.396	51	0.011	3813	0.793	700	0.146	3113	0.648
June	5.76	5.92	3.74	+0.18	+0.002	1.35	1.42	1.385	1.170	+0.250	+0.252	+1211	2031	0.423	41	0.009	3283	0.683	739	0.154	2544	0.529
July	5.94	5.97	3.68	-0.04	0.000	1.36	1.55	1.455	1.420	+0.005	+0.005	+24	2083	0.433	45	0.009	2152	0.448	760	0.158	1392	0.290
Aug.	5.90	5.82	3.38	-0.19	-0.002	1.26	1.53	1.395	1.425	-0.090	-0.092	-442	2103	0.437	42	0.009	1703	0.354	771	0.160	932	0.194
Sept.	5.71	5.60	3.08	-0.25	-0.003	1.19	1.36	1.275	1.335	-0.117	-0.120	-577	2079	0.432	42	0.009	1544	0.321	787	0.164	757	0.157
Oct.	5.46	5.31	2.73	-0.34	-0.004	1.06	1.26	1.16	1.218	-0.213	-0.217	-1043	2035	0.423	42	0.009	1034	0.215	813	0.169	221	0.046
Nov.	5.12	4.94	2.24	-0.20	-0.002	0.75	0.95	0.85	1.005	-0.345	-0.347	-1668	1992	0.414	42	0.009	366	0.076	796	0.166	430	-0.089
Dec.	4.92	4.89	2.05	-0.58	-0.006	0.44	0.50	0.47	0.660	-0.262	-0.268	-1288	2019	0.420	42	0.009	773	0.161	732	0.152	41	0.009

a.—St. Clair River discharge used.

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TABLE 26.
SUPPLY FACTORS OF LAKE ERIE.

DATE	WATER LEVELS OF LAKE ERIE			STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER. <i>a</i>		TOTAL SUPPLY TO LAKE ERIE		INFLOW FROM DETROIT RIVER		LOCAL SUPPLY TO LAKE ERIE.	
	CLEVELAND, O.		Buffalo, N.Y. Mean of Month.	Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Feet Depth.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Foot Depth.
	First of Month	Mean of Month.											
1860													
Jan.		573.26	573.51			2321	2.19			2125	2.01		
Feb.	573.08	2 90	2.93	+0.02	+ 21	2178	2.06	2199	2.08	1447	1.37	+752	+0.71
Mar.	3.10	3.30	3.28	+0.55	+582	2265	2.14	2847	2.69	1942	1.84	+905	+0.86
April	3.65	4.00	3.91	+0.45	+476	2423	2.29	2899	2.74	2051	1.94	+848	+0.80
May	4.10	4.21	4.11	+0.10	+106	2475	2.34	2581	2.44	2214	2.09	+367	+0.35
June	4.20	4.18	4.15	-0.15	-159	2486	2.35	2327	2.20	2326	2.20	+ 1	0.00
July	4.05	3.92	3.96	-0.21	-222	2436	2.30	2214	2.09	2002	1.89	+212	+0.20
Aug.	3.84	3.76	3.72	-0.25	-264	2375	2.25	2111	2.00	1995	1.89	+116	+0.11
Sept.	3.59	3.42	3.44	-0.32	-338	2304	2.18	1966	1.86	1894	1.79	+ 72	+0.07
Oct.	3.27	3.12	3.20	-0.19	-201	2244	2.12	2043	1.93	2376	2.25	-333	-0.31
Nov.	3.08	3.03	3.22	-0.13	-137	2248	2.13	2111	2.00	1935	1.83	+176	+0.17
Dec.	2.95	2.87	3.25	-0.21	-222	2256	2.13	2034	1.92	2250	2.13	-216	-0.20
1861													
Jan.	2.74	2.61	2.86	-0.27	-286	2161	2.04	1875	1.77	<i>b</i> 2306	2.18	-431	-0.41
Feb.	2.47	2.33	2.36	+0.08	+ 85	2045	1.93	2130	2.01	1723	1.63	+407	+0.39
Mar.	2.55	2.77	2.75	+0.74	+782	2136	2.02	2918	2.76	2166	2.05	+752	+0.71
April	3.29	3.81	3.72	+0.73	+772	2375	2.25	3147	2.98	2290	2.17	+857	+0.81
May	4.02	4.24	4.14	+0.26	+275	2485	2.35	2760	2.61	2164	2.05	+596	+0.56
June	4.28	4.31	4.28	-0.10	-106	2521	2.38	2415	2.28	2274	2.15	+141	+0.13
July	4.18	4.06	4.10	-0.10	-106	2474	2.34	2368	2.24	2324	2.20	+ 44	+0.04
Aug.	4.08	4.10	4.06	-0.07	- 74	2463	2.33	2389	2.26	2409	2.28	- 20	-0.02
Sept.	4.01	3.92	3.94	-0.21	-222	2431	2.30	2209	2.09	2358	2.23	-149	-0.14
Oct.	3.80	3.69	3.77	-0.12	-127	2387	2.26	2260	2.14	2299	2.17	- 39	-0.04
Nov.	3.68	3.67	3.86	-0.12	-127	2410	2.28	2283	2.16	2262	2.14	+ 21	+0.02
Dec.	3.56	3.44	3.82	-0.12	-127	2401	2.27	2274	2.15	2264	2.14	+ 10	+0.01
1862													
Jan.	3.44	3.43	3.68	-0.16	-169	2365	2.24	2196	2.08	2053	1.94	+143	+0.13
Feb.	3.28	3.14	3.17	-0.07	- 74	2237	2.12	2163	2.05	1521	1.44	+642	+0.61
Mar.	3.21	3.28	3.26	+0.52	+550	2258	2.14	2808	2.66	2024	1.91	+784	+0.74
April	3.73	4.18	4.09	+0.57	+603	2471	2.34	3074	2.91	2446	2.31	+628	+0.59
May	4.30	4.42	4.32	+0.12	+127	2531	2.39	2658	2.51	2358	2.23	+300	+0.28
June	4.42	4.42	4.39	-0.02	- 21	2551	2.41	2530	2.39	2393	2.26	+137	+0.13
July	4.40	4.39	4.43	-0.20	-211	2562	2.42	2351	2.22	2370	2.24	- 19	-0.02
Aug.	4.20	4.01	3.97	-0.34	-360	2439	2.31	2079	1.97	2428	2.30	-349	-0.33
Sept.	3.86	3.70	3.72	-0.35	-370	2375	2.25	2005	1.90	2411	2.28	-406	-0.38
Oct.	3.51	3.32	3.40	-0.36	-381	2294	2.17	1913	1.81	2398	2.27	-485	-0.46
Nov.	3.15	2.98	3.17	-0.15	-159	2237	2.12	2078	1.97	2362	2.23	-284	-0.27
Dec.	3.00	3.01	3.39	+0.24	+254	2291	2.17	2545	2.41	2212	2.09	+333	+0.31
1863													
Jan.	3.24	3.46	3.71	+0.36	+381	2372	2.24	2753	2.60	2153	2.04	+600	+0.57
Feb.	3.60	3.75	3.78	+0.12	+127	2390	2.26	2517	2.38	2040	1.93	+477	+0.45
Mar.	3.72	3.69	3.67	+0.03	+ 32	2361	2.23	2393	2.26	1878	1.78	+515	+0.49
April	3.75	3.81	3.72	+0.15	+159	2375	2.25	2534	2.40	2122	2.01	+412	+0.39
May	3.90	3.99	3.89	+0.02	+ 21	2418	2.29	2439	2.31	2307	2.18	+132	+0.12
June	3.92	3.85	3.82	-0.13	-137	2400	2.27	2263	2.14	2204	2.08	+ 59	+0.06
July	3.79	3.73	3.77	-0.10	-106	2387	2.26	2281	2.16	2340	2.21	- 59	-0.06
Aug.	3.69	3.65	3.61	-0.23	-243	2346	2.22	2103	1.99	2336	2.21	-233	-0.22
Sept.	3.46	3.26	3.28	-0.42	-444	2264	2.14	1820	1.72	2363	2.23	-543	-0.51
Oct.	3.04	2.82	2.90	-0.42	-444	2172	2.05	1728	1.63	2202	2.08	-474	-0.45
Nov.	2.62	2.41	2.60	-0.22	-233	2101	1.99	1868	1.77	2263	2.14	-395	-0.37
Dec.	2.40	2.38	2.76	-0.16	-169	2137	2.02	1968	1.86	2187	2.07	-219	-0.21
1864													
Jan.	2.24	2.09	2.34	-0.08	- 85	2041	1.93	1956	1.85	<i>b</i> 2278	2.15	-322	-0.30
Feb.	2.16	2.24	2.27	+0.18	+190	2025	1.92	2215	2.09	2043	1.93	+172	+0.16
Mar.	2.34	2.45	2.43	+0.36	+381	2061	1.95	2442	2.31	2048	1.94	+394	+0.37
April	2.70	2.95	2.84	+0.60	+634	2157	2.04	2791	2.64	<i>b</i> 2201	2.08	+590	+0.56
May	3.30	3.65	3.55	+0.32	+338	2332	2.21	2670	2.52	2309	2.18	+361	+0.34
June	3.62	3.60	3.57	-0.15	-159	2337	2.21	2178	2.06	2453	2.32	-275	-0.26
July	3.47	3.34	3.38	-0.27	-286	2288	2.16	2002	1.89	2376	2.25	-374	-0.35
Aug.	3.20	3.07	3.03	-0.24	-254	2203	2.08	1949	1.84	2341	2.21	-392	-0.37
Sept.	2.96	2.85	2.87	-0.26	-275	2165	2.05	1890	1.79	2310	2.18	-420	-0.40
Oct.	2.70	2.54	2.62	-0.24	-254	2105	1.99	1851	1.75	2121	2.01	-270	-0.26
Nov.	2.46	2.37	2.56	-0.06	- 63	2091	1.98	2028	1.92	2162	2.04	-134	-0.13
Dec.	2.40	2.44	2.82	-0.18	-190	2153	2.04	1963	1.86	2133	2.02	-170	-0.16

a.—Discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
b.—St. Clair River discharge used.

TABLE 26.—Continued.
SUPPLY FACTORS OF LAKE ERIE.

DATE	WATER LEVELS OF LAKE ERIE			STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER. <i>a</i>		TOTAL SUPPLY TO LAKE ERIE		INFLOW FROM DETROIT RIVER		LOCAL SUPPLY TO LAKE ERIE.	
	CLEVELAND, O.		Buffalo, N.Y. Mean of Month.	Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Feet Depth.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Foot Depth.
	First of Month	Mean of Month.											
1865													
Jan.	572.22	572.01	572.26	-0.50	-529	2022	1.91	1493	1.41	1594	1.51	-101	-0.10
Feb.	1.72	1.43	1.46	-0.13	-137	1846	1.75	1709	1.62	1446	1.37	+263	+0.25
Mar.	1.59	1.75	1.73	+0.52	+550	1904	1.80	2454	2.32	1693	1.60	+761	+0.72
April	2.11	2.47	2.38	+0.65	+687	2050	1.94	2737	2.59	2092	1.98	+645	+0.61
May	2.76	3.05	2.95	+0.28	+296	2183	2.06	2479	2.34	2204	2.08	+275	+0.26
June	3.04	3.03	3.00	-0.03	-32	2195	2.08	2163	2.05	2241	2.12	-78	-0.07
July	3.01	2.99	3.03	-0.06	-63	2203	2.08	2140	2.02	2333	2.21	-193	-0.18
Aug.	2.95	2.91	2.87	-0.06	-63	2165	2.05	2102	1.99	2340	2.21	-238	-0.23
Sept.	2.89	2.87	2.89	-0.17	-180	2171	2.05	1991	1.88	2321	2.19	-330	-0.31
Oct.	2.72	2.57	2.65	-0.34	-360	2112	2.00	1752	1.66	2276	2.15	-524	-0.50
Nov.	2.38	2.19	2.38	-0.26	-275	2050	1.94	1775	1.68	2179	2.06	-404	-0.38
Dec.	2.12	2.05	2.43	-0.20	-211	2061	1.95	1850	1.75	2087	1.97	-237	-0.22
1866													
Jan.	1.92	1.78	2.03	-0.22	-233	1971	1.86	1738	1.64	<i>b</i> 2026	1.92	-288	-0.27
Feb.	1.70	1.62	1.65	+0.12	+127	1887	1.78	2014	1.90	1928	1.82	+86	+0.08
Mar.	1.82	2.01	1.99	+0.48	+508	1962	1.86	2470	2.34	1850	1.75	+620	+0.59
April	2.30	2.59	2.50	+0.40	+423	2077	1.96	2500	2.36	<i>b</i> 1964	1.87	+536	+0.51
May	2.70	2.81	2.71	+0.24	+254	2125	2.01	2379	2.25	2098	1.98	+281	+0.27
June	2.94	3.07	3.04	+0.18	+190	2206	2.09	2396	2.27	2183	2.06	+213	+0.20
July	3.12	3.18	3.22	-0.06	-63	2248	2.13	2185	2.07	2268	2.14	-83	-0.08
Aug.	3.06	2.93	2.89	-0.16	-169	2169	2.05	2000	1.89	2256	2.13	-256	-0.24
Sept.	2.90	2.87	2.89	-0.04	-42	2169	2.05	2127	2.01	2243	2.12	-116	-0.11
Oct.	2.86	2.86	2.94	-0.12	-127	2181	2.06	2054	1.94	2228	2.11	-174	-0.16
Nov.	2.74	2.62	2.81	-0.12	-127	2150	2.03	2023	1.91	2295	2.17	-272	-0.26
Dec.	2.62	2.63	3.01	-0.14	-148	2197	2.08	2049	1.94	2272	2.15	-223	-0.21
1867													
Jan.	2.48	2.34	2.59	-0.30	-317	2098	1.98	1781	1.68	1881	1.78	-100	-0.09
Feb.	2.18	2.02	2.05	+0.04	+42	1975	1.87	2017	1.91	1996	1.89	+21	+0.02
Mar.	2.22	2.42	2.40	+0.36	+381	2055	1.94	2436	2.30	1641	1.55	+795	+0.75
April	2.58	2.74	2.65	+0.42	+444	2112	2.00	2556	2.42	<i>b</i> 2118	2.00	+438	+0.41
May	3.00	3.26	3.16	+0.42	+444	2234	2.11	2678	2.53	2299	2.17	+379	+0.36
June	3.42	3.57	3.54	+0.06	+63	2330	2.20	2393	2.26	2427	2.30	-34	-0.03
July	3.48	3.38	3.42	-0.26	-275	2298	2.17	2023	1.91	2381	2.25	-358	-0.34
Aug.	3.22	3.07	3.03	-0.34	-360	2203	2.08	1843	1.74	2420	2.29	-577	-0.55
Sept.	2.88	2.68	2.70	-0.37	-391	2123	2.01	1732	1.64	2337	2.21	-605	-0.57
Oct.	2.51	2.34	2.42	-0.42	-444	2058	1.95	1614	1.53	2231	2.11	-617	-0.58
Nov.	2.09	1.84	2.03	-0.36	-381	1970	1.86	1589	1.50	2154	2.04	-565	-0.53
Dec.	1.73	1.62	2.00	-0.21	-222	1964	1.86	1742	1.65	2093	1.98	-351	-0.33
1868													
Jan.	1.52	1.42	1.67	-0.29	-307	1891	1.79	1584	1.50	<i>b</i> 2042	1.93	-458	-0.43
Feb.	1.23	1.04	1.07	+0.11	+116	1765	1.67	1881	1.78	1733	1.64	+148	+0.14
Mar.	1.34	1.63	1.61	+0.70	+740	1878	1.78	2618	2.48	2179	2.06	+439	+0.42
April	2.04	2.46	2.37	+0.64	+677	2048	1.94	2725	2.58	2095	1.98	+630	+0.60
May	2.68	2.91	2.81	+0.42	+444	2149	2.03	2593	2.45	2209	2.09	+384	+0.36
June	3.10	3.30	3.27	+0.18	+190	2261	2.14	2451	2.32	2266	2.14	+185	+0.17
July	3.28	3.27	3.31	-0.27	-286	2270	2.15	1984	1.88	2211	2.09	-227	-0.21
Aug.	3.01	2.75	2.71	-0.39	-412	2125	2.01	1713	1.62	2180	2.06	-467	-0.44
Sept.	2.62	2.48	2.50	-0.36	-381	2077	1.96	1696	1.60	2146	2.03	-450	-0.43
Oct.	2.26	2.03	2.11	-0.31	-328	1987	1.88	1659	1.57	2064	1.95	-405	-0.38
Nov.	1.95	1.87	2.06	-0.19	-201	1976	1.87	1775	1.68	2016	1.91	-241	-0.23
Dec.	1.76	1.66	2.04	-0.10	-106	1973	1.87	1867	1.77	1998	1.89	-131	-0.12
1869													
Jan.	1.66	1.65	1.90	-0.04	-42	1941	1.84	1899	1.80	1844	1.74	-55	+0.05
Feb.	1.62	1.58	1.61	+0.20	+211	1878	1.78	2089	1.98	1692	1.60	+397	+0.38
Mar.	1.82	2.06	2.04	+0.39	+412	1973	1.87	2385	2.26	1607	1.52	+778	+0.74
April	2.21	2.36	2.27	+0.43	+455	2025	1.92	2480	2.35	1976	1.87	+504	+0.48
May	2.64	2.91	2.81	+0.46	+486	2149	2.03	2635	2.49	1848	1.75	+787	+0.74
June	3.10	3.30	3.27	+0.34	+360	2261	2.14	2621	2.48	2030	1.92	+591	+0.56
July	3.44	3.58	3.62	+0.09	+95	2348	2.22	2443	2.31	2184	2.07	+259	+0.24
Aug.	3.53	3.48	3.44	-0.19	-201	2304	2.18	2103	1.99	2211	2.09	-108	-0.10
Sept.	3.34	3.21	3.23	-0.36	-381	2251	2.13	1870	1.77	2192	2.07	-322	-0.30
Oct.	2.98	2.76	2.84	-0.45	-476	2157	2.04	1681	1.59	2091	1.98	-410	-0.39
Nov.	2.53	2.30	2.49	-0.05	-53	2075	1.96	2022	1.91	2121	2.01	-99	-0.09
Dec.	2.48	2.65	3.03	+0.29	+307	2203	2.08	2510	2.37	2133	2.02	+377	+0.36

a.—Discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
b.—St. Clair River discharge used.

SESSIONAL PAPER No. 54.

TABLE 26.—Continued.

SUPPLY FACTORS OF LAKE ERIE.

DATE	WATER LEVELS OF LAKE ERIE			STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER. <i>a</i>		TOTAL SUPPLY TO LAKE ERIE		INFLOW FROM DETROIT RIVER		LOCAL SUPPLY TO LAKE ERIE.	
	CLEVELAND, O.		Buffalo, N.Y. Mean of Month.	Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Feet Depth.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Foot Depth.
	First of Month	Mean of Month.											
1870													
Jan.	572.77	572.89	573.14	+0.23	+ 243	2229	2.11	2472	2.34	52021	1.91	+ 451	+0.43
Feb.	3.00	3.12	3.15	0.00	0	2231	2.11	2231	2.11	1757	1.66	+ 474	+0.45
Mar.	3.00	2.89	2.87	+0.22	+ 233	2164	2.05	2397	2.27	1853	1.75	+ 544	+0.51
April	3.22	3.54	3.45	+0.42	+ 444	2306	2.18	2750	2.60	2154	2.04	+ 596	+0.56
May	3.64	3.75	3.65	+0.10	+ 106	2356	2.23	2462	2.33	2212	2.09	+ 250	+0.24
June	3.74	3.72	3.69	0.00	0	2368	2.24	2368	2.24	2354	2.23	+ 14	+0.01
July	3.74	3.76	3.80	0.00	0	2395	2.26	2395	2.26	2456	2.32	— 61	—0.06
Aug.	3.74	3.71	3.67	—0.16	— 169	2361	2.23	2192	2.07	2431	2.30	— 239	—0.23
Sept.	3.58	3.46	3.48	—0.31	— 328	2314	2.19	1986	1.88	2373	2.24	— 387	—0.37
Oct.	3.27	3.08	3.16	—0.34	— 360	2234	2.11	1874	1.77	2248	2.13	— 374	—0.35
Nov.	2.93	2.78	2.97	—0.21	— 222	2188	2.07	1966	1.86	2248	2.13	— 282	—0.27
Dec.	2.72	2.66	3.04	—0.16	— 169	2206	2.09	2037	1.93	2210	2.09	— 173	—0.16
1871													
Jan.	2.56	2.45	2.70	—0.28	— 296	2123	2.01	1827	1.73	2059	1.95	— 232	—0.22
Feb.	2.28	2.12	2.15	+0.06	+ 63	1997	1.89	2060	1.95	1679	1.59	+ 381	+0.36
Mar.	2.34	2.57	2.55	+0.47	+ 497	2088	1.97	2585	2.44	52257	2.13	+ 328	+0.31
April	2.81	3.05	2.96	+0.37	+ 391	2185	2.07	2576	2.44	2370	2.24	+ 206	+0.19
May	3.18	3.32	3.22	+0.16	+ 169	2248	2.13	2417	2.29	2429	2.30	— 12	—0.01
June	3.34	3.35	3.32	0.00	0	2273	2.15	2273	2.15	2463	2.33	— 190	—0.18
July	3.34	3.33	3.37	—0.12	— 127	2285	2.16	2158	2.04	2466	2.33	— 308	—0.29
Aug.	3.22	3.12	3.08	—0.18	— 190	2215	2.09	2025	1.92	2415	2.28	— 390	—0.37
Sept.	3.04	2.95	2.97	—0.42	— 444	2188	2.07	1744	1.65	2319	2.19	— 575	—0.54
Oct.	2.62	2.28	2.36	—0.43	— 455	2045	1.93	1590	1.50	2186	2.07	— 596	—0.56
Nov.	2.19	2.10	2.29	—0.31	— 328	2029	1.92	1701	1.61	2174	2.06	— 473	—0.45
Dec.	1.88	1.66	2.04	—0.26	— 275	1973	1.87	1698	1.61	2334	2.21	— 636	—0.60
1872													
Jan.	1.62	1.58	1.83	—0.16	— 169	1925	1.82	1756	1.66	1995	1.89	— 239	—0.23
Feb.	1.46	1.34	1.37	—0.16	— 169	—1828	1.73	1659	1.57	2032	1.92	— 373	—0.35
Mar.	1.30	1.25	1.23	+0.05	+ 53	1798	1.70	1851	1.75	1936	1.83	— 85	—0.08
April	1.35	1.45	1.36	+0.32	+ 338	1825	1.73	2163	2.05	51996	1.89	+ 167	+0.16
May	1.67	1.89	1.79	+0.41	+ 434	1917	1.81	2351	2.22	2100	1.99	+ 251	+0.24
June	2.08	2.26	2.23	+0.18	+ 190	2016	1.91	2206	2.09	2217	2.10	— 11	—0.01
July	2.26	2.25	2.29	—0.02	— 21	2029	1.92	2008	1.90	2059	1.95	— 51	—0.05
Aug.	2.24	2.22	2.18	—0.14	— 148	2005	1.90	1857	1.76	2132	2.02	— 275	—0.26
Sept.	2.10	1.99	2.01	—0.20	— 211	1966	1.86	1755	1.66	2126	2.01	— 371	—0.35
Oct.	1.90	1.82	1.90	—0.24	— 254	1941	1.84	1687	1.60	2146	2.03	— 459	—0.43
Nov.	1.66	1.49	1.68	—0.28	— 296	1893	1.79	1597	1.51	2024	1.91	— 427	—0.40
Dec.	1.38	1.26	1.64	—0.17	— 180	—1885	1.78	1705	1.61	2005	1.90	— 300	—0.28
1873													
Jan.	1.21	1.16	1.41	—0.05	— 53	1835	1.74	1782	1.69	1796	1.70	— 14	—0.01
Feb.	1.16	1.17	1.20	+0.04	+ 42	1792	1.69	1834	1.73	1924	1.82	— 90	—0.09
Mar.	1.20	1.24	1.22	+0.68	+ 719	1796	1.70	2515	2.38	2069	1.96	+ 446	+0.42
April	1.88	2.52	2.43	+0.98	+1036	2061	1.95	3097	2.93	51991	1.88	+1106	+1.05
May	2.86	3.19	3.09	+0.37	+ 391	2217	2.10	2608	2.47	1997	1.89	+ 611	+0.58
June	3.23	3.27	3.24	+0.03	+ 32	2255	2.13	2287	2.16	2133	2.02	+ 154	+0.15
July	3.26	3.25	3.29	—0.04	— 42	2267	2.14	2225	2.10	2195	2.08	+ 30	+0.03
Aug.	3.22	3.19	3.15	—0.23	— 243	2231	2.11	1988	1.88	2201	2.08	— 213	—0.20
Sept.	2.99	2.79	2.81	—0.35	— 370	2150	2.03	1780	1.68	2202	2.08	— 422	—0.40
Oct.	2.64	2.49	2.57	—0.25	— 264	2094	1.98	1830	1.73	2141	2.02	— 311	—0.29
Nov.	2.39	2.29	2.48	+0.09	+ 95	2072	1.96	2167	2.05	2134	2.02	+ 33	+0.03
Dec.	2.48	2.66	3.04	+0.38	+ 402	2206	2.09	2608	2.47	2067	1.95	+ 541	+0.51
1874													
Jan.	2.86	3.05	3.30	+0.22	+ 233	2269	2.15	2502	2.37	1470	1.39	+1032	+0.98
Feb.	3.08	3.10	3.13	+0.04	+ 42	2227	2.11	2269	2.15	1053	1.00	+1216	+1.15
Mar.	3.12	3.13	3.11	+0.10	+ 106	2221	2.10	2327	2.20	1947	1.84	+ 380	+0.36
April	3.22	3.30	3.21	+0.12	+ 127	2246	2.12	2373	2.24	2053	1.94	+ 320	+0.30
May	3.34	3.39	3.29	+0.08	+ 85	2267	2.14	2352	2.22	1998	1.89	+ 354	+0.33
June	3.42	3.46	3.43	+0.06	+ 63	2301	2.18	2364	2.24	2106	1.99	+ 258	+0.24
July	3.48	3.49	3.53	—0.07	— 74	2327	2.20	2253	2.13	2168	2.05	+ 85	+0.08
Aug.	3.41	3.33	3.29	—0.31	— 328	2267	2.14	1939	1.83	2164	2.05	— 225	—0.21
Sept.	3.10	2.87	2.89	—0.45	— 476	2170	2.05	1694	1.60	2200	2.08	— 506	—0.48
Oct.	2.65	2.43	2.51	—0.43	— 455	2079	1.97	1624	1.54	2185	2.07	— 561	—0.53
Nov.	2.22	2.01	2.20	—0.32	— 338	2009	1.90	1671	1.58	2183	2.06	— 512	—0.48
Dec.	1.90	1.80	2.18	—0.22	— 233	2005	1.90	1772	1.68	2027	1.92	— 255	—0.24

a.—Discharge values include a flow of 1000 c f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
b.—St. Clair River discharge used.

TABLE 26.—Continued.

SUPPLY FACTORS OF LAKE ERIE.

DATE	WATER LEVELS OF LAKE ERIE			STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER. <i>a</i>		TOTAL SUPPLY TO LAKE ERIE		INFLOW FROM DETROIT RIVER		LOCAL SUPPLY TO LAKE ERIE.	
	CLEVELAND, O.		Buffalo, N.Y. Mean of Month.	Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Feet Depth.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Foot Depth.
	First of Month	Mean of Month.											
1875													
Jan.	571.68	571.57	571.82	-0.20	- 211	1923	1.82	1712	1.62	2008	1.90	- 296	-0.28
Feb.	1.48	1.40	1.43	-0.01	- 11	1840	1.74	1829	1.73	2045	1.93	- 216	-0.20
Mar.	1.47	1.54	1.52	+0.27	+ 286	1860	1.76	2146	2.03	2093	1.98	+ 53	+0.05
April	1.74	1.94	1.85	+0.44	+ 465	1929	1.82	2394	2.26	2027	1.92	+ 367	+0.35
May	2.18	2.41	2.31	+0.44	+ 465	2033	1.92	2408	2.36	2187	2.07	+ 311	+0.29
June	2.62	2.84	2.81	+0.28	+ 296	2149	2.03	2445	2.31	2157	2.04	+ 288	+0.27
July	2.90	2.97	3.01	+0.06	+ 63	2197	2.08	2260	2.14	2218	2.10	+ 42	+0.04
Aug.	2.96	2.96	2.92	-0.07	- 74	2176	2.06	2102	1.99	2175	2.06	- 73	-0.07
Sept.	2.89	2.82	2.84	-0.31	- 328	2157	2.04	1829	1.73	2140	2.02	- 311	-0.29
Oct.	2.58	2.33	2.41	-0.32	- 338	2056	1.94	1718	1.62	2177	2.06	- 459	-0.43
Nov.	2.26	2.18	2.37	+0.03	+ 32	2047	1.94	2079	1.97	2158	2.04	- 79	-0.07
Dec.	2.29	2.40	2.78	+0.09	+ 95	2143	2.03	2238	2.12	1980	1.87	+ 258	+0.24
1876													
Jan.	2.38	2.36	2.61	+0.26	+ 275	2102	1.99	2377	2.25	2060	1.95	+ 317	+0.30
Feb.	2.64	2.92	2.95	+0.60	+ 634	2183	2.06	2817	2.66	2160	2.04	+ 657	+0.62
Mar.	3.24	3.57	3.55	+0.59	+ 624	2332	2.21	2956	2.80	b2188	2.07	+ 768	+0.73
April	3.83	4.09	4.00	+0.42	+ 444	2446	2.31	2890	2.73	2240	2.12	+ 650	+0.61
May	4.25	4.41	4.31	+0.21	+ 222	2528	2.39	2750	2.60	1955	1.85	+ 795	+0.75
June	4.46	4.52	4.49	0.00	0	2578	2.44	2578	2.44	2511	2.37	+ 67	+0.06
July	4.46	4.41	4.45	-0.20	- 211	2567	2.43	2356	2.23	2627	2.48	- 271	-0.26
Aug.	4.26	4.11	4.07	-0.24	- 254	2465	2.33	2211	2.09	2618	2.48	- 407	-0.38
Sept.	4.02	3.94	3.96	-0.34	- 360	2435	2.30	2075	1.96	2389	2.26	- 314	-0.30
Oct.	3.68	3.41	3.49	-0.23	- 243	2317	2.19	2074	1.96	2352	2.22	- 278	-0.26
Nov.	3.45	3.49	3.68	-0.13	- 137	2365	2.24	2228	2.11	2300	2.18	- 72	-0.07
Dec.	3.32	3.15	3.53	-0.37	- 391	2327	2.20	1936	1.83	b2283	2.16	- 347	-0.33
1877													
Jan.	2.95	2.75	3.00	-0.28	- 296	2196	2.08	1900	1.80	b2371	2.24	- 471	-0.45
Feb.	2.67	2.59	2.62	-0.19	- 201	2105	1.99	1904	1.80	1947	1.84	- 43	-0.04
Mar.	2.48	2.36	2.34	+0.10	+ 106	2041	1.93	2147	2.03	1342	1.27	+ 805	+0.76
April	2.58	2.79	2.70	+0.34	+ 360	2124	2.01	2484	2.35	1753	1.66	+ 731	+0.69
May	2.92	3.04	2.94	+0.16	+ 169	2181	2.06	2350	2.22	1799	1.70	+ 551	+0.52
June	3.08	3.12	3.09	+0.16	+ 169	2217	2.10	2386	2.26	2251	2.13	+ 135	+0.13
July	3.24	3.36	3.40	+0.05	+ 53	2294	2.17	2347	2.22	2290	2.17	+ 57	+0.05
Aug.	3.29	3.22	3.18	-0.11	- 116	2239	2.12	2123	2.01	2277	2.15	- 154	-0.15
Sept.	3.18	3.14	3.16	-0.24	- 254	2234	2.11	1980	1.87	2164	2.05	- 184	-0.17
Oct.	2.94	2.74	2.82	-0.24	- 254	2152	2.04	1898	1.79	2232	2.11	- 334	-0.32
Nov.	2.70	2.66	2.85	0.00	0	2159	2.04	2159	2.04	1943	1.84	+ 216	+0.20
Dec.	2.70	2.74	3.12	+0.08	+ 85	2225	2.10	2310	2.18	2149	2.03	+ 161	+0.15
1878													
Jan.	2.78	2.82	3.07	+0.11	+ 116	2213	2.09	2329	2.20	2054	1.94	+ 275	+0.26
Feb.	2.89	2.96	2.99	+0.13	+ 137	2195	2.08	2332	2.21	1518	1.44	+ 814	+0.77
Mar.	3.02	3.09	3.07	+0.28	+ 296	2213	2.09	2509	2.37	1566	1.48	+ 943	+0.89
April	3.30	3.51	3.42	+0.33	+ 349	2298	2.17	2647	2.50	2217	2.10	+ 430	+0.41
May	3.63	3.75	3.65	+0.12	+ 127	2356	2.23	2483	2.35	2231	2.11	+ 252	+0.24
June	3.75	3.75	3.72	0.00	0	2375	2.25	2375	2.25	2271	2.15	+ 104	+0.10
July	3.75	3.75	3.79	-0.11	- 116	2393	2.26	2277	2.15	2316	2.19	- 39	-0.04
Aug.	3.64	3.53	3.49	-0.18	- 190	2317	2.19	2127	2.01	2330	2.20	- 203	-0.19
Sept.	3.46	3.40	3.42	-0.24	- 254	2298	2.17	2044	1.93	2178	2.06	- 134	-0.13
Oct.	3.22	3.05	3.13	-0.27	- 286	2227	2.11	1941	1.84	2168	2.05	- 227	-0.21
Nov.	2.95	2.85	3.04	-0.06	- 63	2206	2.09	2143	2.03	2088	1.97	+ 55	+0.05
Dec.	2.89	2.93	3.31	-0.17	- 180	2271	2.15	2091	1.98	1855	1.75	+ 236	+0.22
1879													
Jan.	2.72	2.51	2.76	-0.28	- 296	2137	2.02	1841	1.74	1771	1.67	+ 70	+0.07
Feb.	2.44	2.37	2.40	-0.06	- 63	2055	1.94	1992	1.88	1482	1.40	+ 510	+0.48
Mar.	2.38	2.40	2.38	+0.20	+ 211	2051	1.94	2262	2.14	1849	1.75	+ 413	+0.39
April	2.58	2.76	2.67	+0.26	+ 275	2118	2.00	2393	2.26	2062	1.95	+ 331	+0.31
May	2.84	2.91	2.81	+0.12	+ 127	2149	2.03	2276	2.15	1950	1.84	+ 326	+0.31
June	2.96	3.00	2.97	+0.06	+ 63	2187	2.07	2250	2.13	2078	1.97	+ 172	+0.16
July	3.02	3.03	3.07	-0.10	- 106	2213	2.09	2107	1.99	2104	1.99	+ 3	0.00
Aug.	2.92	2.81	2.77	-0.28	- 296	2140	2.02	1844	1.74	2052	1.94	- 208	-0.20
Sept.	2.64	2.48	2.50	-0.28	- 296	2077	1.96	1781	1.68	2058	1.95	- 277	-0.26
Oct.	2.36	2.25	2.33	-0.34	- 360	2038	1.93	1678	1.59	1961	1.85	- 283	-0.27
Nov.	2.02	1.78	1.97	-0.11	- 116	1956	1.85	1840	1.74	1978	1.87	- 138	-0.13
Dec.	1.91	2.04	2.42	+0.38	+ 402	2059	1.95	2461	2.33	1956	1.85	+ 505	+0.48

a.—Discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.

b.—St. Clair River discharge used.

SESSIONAL PAPER No. 54.

TABLE 26.—Continued.

SUPPLY FACTORS OF LAKE ERIE.

DATE	WATER LEVELS OF LAKE ERIE			STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER. <i>a</i>		TOTAL SUPPLY TO LAKE ERIE		INFLOW FROM DETROIT RIVER		LOCAL SUPPLY TO LAKE ERIE.	
	CLEVELAND, O.		Buffalo, N.Y. Mean of Month.	Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Feet Depth.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Foot Depth.
	First of Month	Mean of Month.											
1800													
Jan.	572.29	572.54	572.79	+0.27	+ 286	2146	2.03	2432	2.30	1931	1.83	+ 501	+0.47
Feb.	2.56	2.58	2.61	+0.09	+ 95	2103	1.99	2198	2.08	1709	1.62	+ 489	+0.46
Mar.	2.65	2.72	2.70	+0.15	+ 159	2124	2.01	2283	2.16	1903	1.80	+ 380	+0.36
April	2.80	2.88	2.79	+0.22	+ 233	2145	2.03	2378	2.25	1974	1.87	+ 404	+0.38
May	3.02	3.15	3.05	+0.18	+ 190	2207	2.09	2397	2.27	1983	1.88	+ 414	+0.39
June	3.20	3.26	3.23	+0.10	+ 106	2251	2.13	2357	2.23	2176	2.06	+ 181	+0.17
July	3.30	3.35	3.39	-0.07	- 74	2291	2.17	2217	2.10	2095	1.98	+ 122	+0.12
Aug.	3.23	3.11	3.07	-0.23	- 243	2213	2.09	1970	1.86	2216	2.10	- 246	-0.23
Sept.	3.00	2.88	2.90	-0.34	- 360	2172	2.05	1812	1.71	2153	2.04	- 341	-0.32
Oct.	2.66	2.44	2.52	-0.26	- 275	2081	1.97	1806	1.71	2089	1.98	- 283	-0.27
Nov.	2.40	2.36	2.55	-0.21	- 222	2088	1.97	1866	1.76	2058	1.95	- 192	-0.18
Dec.	2.19	2.02	2.40	-0.37	- 391	2055	1.94	1664	1.57	2054	1.94	- 390	-0.37
1881													
Jan.	1.82	1.61	1.86	-0.16	- 169	1931	1.83	1762	1.67	1756	1.66	+ 6	+0.01
Feb.	1.66	1.72	1.75	+0.22	+ 233	1908	1.80	2141	2.02	1968	1.86	+ 173	+0.16
Mar.	1.88	2.04	2.02	+0.51	+ 539	1968	1.86	2507	2.37	1891	1.79	+ 616	+0.58
April	2.39	2.74	2.65	+0.55	+ 582	2112	2.00	2694	2.55	2025	1.92	+ 669	+0.63
May	2.94	3.14	3.04	+0.32	+ 338	2205	2.09	2543	2.40	2083	1.97	+ 460	+0.44
June	3.26	3.38	3.35	+0.10	+ 106	2281	2.16	2387	2.26	2182	2.06	+ 205	+0.19
July	3.36	3.33	3.37	-0.19	- 201	2286	2.16	2085	1.97	2178	2.06	- 92	-0.09
Aug.	3.17	3.01	2.97	-0.33	- 349	2188	2.07	1839	1.74	2209	2.09	- 370	-0.35
Sept.	2.84	2.66	2.68	-0.20	- 211	2119	2.00	1908	1.80	2247	2.12	- 339	-0.32
Oct.	2.64	2.61	2.69	-0.12	- 127	2121	2.01	1994	1.89	2137	2.02	- 143	-0.14
Nov.	2.52	2.43	2.62	+0.02	+ 21	2105	1.99	2126	2.01	2288	2.16	- 162	-0.15
Dec.	2.54	2.64	3.02	+0.34	+ 360	2200	2.08	2560	2.42	2232	2.11	+ 328	+0.31
1882													
Jan.	2.88	3.11	3.36	+0.23	+ 243	2283	2.16	2526	2.39	2225	2.10	+ 301	+0.28
Feb.	3.11	3.11	3.14	+0.23	+ 243	2229	2.11	2472	2.34	2045	1.93	+ 427	+0.40
Mar.	3.34	3.56	3.54	+0.33	+ 349	2330	2.20	2679	2.53	2194	2.07	+ 485	+0.46
April	3.67	3.78	3.69	+0.21	+ 222	2367	2.24	2589	2.45	2182	2.06	+ 407	+0.38
May	3.88	3.98	3.88	+0.18	+ 190	2416	2.28	2606	2.46	2368	2.24	+ 238	+0.23
June	4.06	4.13	4.10	+0.04	+ 42	2474	2.34	2516	2.38	2206	2.09	+ 310	+0.29
July	4.10	4.06	4.10	-0.11	- 116	2474	2.34	2358	2.23	2580	2.44	- 222	-0.21
Aug.	3.99	3.92	3.88	-0.21	- 222	2416	2.28	2194	2.07	2615	2.47	- 421	-0.40
Sept.	3.78	3.65	3.67	-0.36	- 381	2362	2.23	1981	1.87	2321	2.19	- 340	-0.32
Oct.	3.42	3.20	3.28	-0.38	- 402	2265	2.14	1863	1.76	2271	2.15	- 408	-0.39
Nov.	3.04	2.88	3.07	-0.42	- 444	2213	2.09	1769	1.67	2251	2.13	- 482	-0.46
Dec.	2.62	2.37	2.75	-0.30	- 317	2135	2.02	1818	1.72	<i>b</i> 2139	2.02	- 321	-0.30
1883													
Jan.	2.32	2.28	2.53	+0.06	+ 63	2084	1.97	2147	2.03	<i>b</i> 2238	2.12	- 91	-0.09
Feb.	2.38	2.49	2.52	+0.20	+ 211	2081	1.97	2292	2.17	2228	2.11	+ 61	+0.06
Mar.	2.58	2.68	2.66	+0.16	+ 169	2115	2.00	2284	2.16	1856	1.76	+ 428	+0.40
April	2.74	2.80	2.71	+0.29	+ 307	2126	2.01	2433	2.30	2156	2.04	+ 277	+0.26
May	3.03	3.26	3.16	+0.58	+ 613	2234	2.11	2847	2.69	2230	2.11	+ 617	+0.58
June	3.61	3.96	3.93	+0.45	+ 476	2427	2.30	2903	2.75	2434	2.30	+ 469	+0.44
July	4.06	4.16	4.20	+0.07	+ 74	2500	2.36	2574	2.43	2754	2.60	- 180	-0.17
Aug.	4.13	4.10	4.06	-0.19	- 201	2462	2.33	2261	2.14	2716	2.57	- 455	-0.43
Sept.	3.94	3.79	3.81	-0.31	- 328	2397	2.27	2069	1.96	2538	2.40	- 469	-0.44
Oct.	3.63	3.47	3.55	-0.35	- 370	2332	2.21	1962	1.86	2402	2.27	- 440	-0.42
Nov.	3.28	3.09	3.28	-0.18	- 190	2265	2.14	2075	1.96	2307	2.18	- 232	-0.22
Dec.	3.10	3.12	3.50	-0.14	- 148	2320	2.19	2172	2.05	2211	2.09	- 39	-0.04
1884													
Jan.	2.96	2.79	3.04	-0.04	- 42	2206	2.09	2164	2.05	1514	1.43	+ 650	+0.61
Feb.	2.92	3.05	3.08	+0.22	+ 233	2215	2.09	2448	2.32	1703	1.61	+ 715	+0.70
Mar.	3.14	3.24	3.22	+0.38	+ 402	2248	2.13	2650	2.51	2426	2.29	+ 224	+0.21
April	3.52	3.79	3.70	+0.40	+ 423	2370	2.24	2793	2.64	2428	2.30	+ 364	+0.35
May	3.92	4.06	3.96	+0.18	+ 190	2436	2.30	2626	2.48	2444	2.31	+ 182	+0.17
June	4.10	4.14	4.11	-0.07	- 74	2475	2.34	2401	2.27	2531	2.39	- 130	-0.12
July	4.03	3.92	3.96	-0.19	- 201	2436	2.30	2235	2.11	2611	2.47	- 376	-0.36
Aug.	3.84	3.76	3.72	-0.30	- 317	2375	2.25	2058	1.95	2489	2.35	- 431	-0.41
Sept.	3.54	3.33	3.35	-0.38	- 402	2281	2.16	1879	1.78	2410	2.28	- 531	-0.50
Oct.	3.16	3.00	3.08	-0.40	- 423	2215	2.09	1792	1.69	2367	2.24	- 575	-0.54
Nov.	2.76	2.52	2.71	-0.28	- 296	2126	2.01	1830	1.73	2336	2.21	- 506	-0.48
Dec.	2.48	2.45	2.83	-0.12	- 127	2155	2.04	2028	1.92	2381	2.25	- 356	-0.34

a.—Discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
b.—St. Clair River discharge used.

TABLE 26.—Continued.

SUPPLY FACTORS OF LAKE ERIE.

DATE	WATER LEVELS OF LAKE ERIE			STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER. <i>a</i>		TOTAL SUPPLY TO LAKE ERIE		INFLOW FROM DETROIT RIVER		LOCAL SUPPLY TO LAKE ERIE.	
	CLEVELAND, O.		Buffalo, N.Y. Mean of Month.	Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Feet Depth.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Foot Depth.
	First of Month	Mean of Month.											
1885													
Jan.	572.36	572.27	572.52	-0.20	- 211	2081	1.97	1870	1.77	<i>b</i> 2398	2.27	- 528	-0.50
Feb.	2.16	2.06	2.09	-0.17	- 180	1984	1.88	1804	1.71	2352	2.22	- 548	-0.52
Mar.	1.99	1.92	1.90	+0.34	+ 360	1941	1.84	2301	2.18	<i>b</i> 2364	2.24	- 63	-0.06
April	2.33	2.74	2.65	+0.77	+ 814	2112	2.00	2926	2.77	<i>b</i> 2287	2.15	+ 639	+0.60
May	3.10	3.47	3.37	+0.62	+ 656	2286	2.16	2942	2.78	2386	2.26	+ 556	+0.53
June	3.72	3.98	3.95	+0.24	+ 254	2434	2.30	2688	2.54	2445	2.31	+ 243	+0.23
July	3.96	3.94	3.98	-0.02	- 21	2441	2.31	2420	2.29	2376	2.25	+ 44	+0.04
Aug.	3.94	3.95	3.91	-0.06	- 63	2423	2.29	2360	2.23	2432	2.30	- 72	-0.07
Sept.	3.88	3.80	3.82	-0.13	- 137	2400	2.27	2263	2.14	2396	2.27	- 133	-0.13
Oct.	3.75	3.70	3.78	-0.11	- 116	2390	2.26	2274	2.15	2217	2.10	+ 57	+0.05
Nov.	3.64	3.58	3.77	0.08	- 85	2387	2.26	2302	2.18	2276	2.15	+ 26	+0.02
Dec.	3.56	3.53	3.91	-0.02	- 21	2423	2.29	2402	2.27	2204	2.08	+ 198	+0.19
1886													
Jan.	3.54	3.55	3.80	-0.36	- 381	2395	2.26	2014	1.90	1677	1.59	+ 337	+0.32
Feb.	3.18	2.82	2.85	-0.46	- 486	2159	2.04	1673	1.58	1490	1.41	+ 183	+0.17
Mar.	2.72	2.63	2.61	+0.35	+ 370	2103	1.99	2473	2.34	2008	1.90	+ 465	+0.44
April	3.07	3.51	3.42	+0.59	+ 624	2298	2.17	2922	2.76	2118	2.00	+ 804	+0.76
May	3.66	3.81	3.71	+0.20	+ 211	2372	2.24	2583	2.44	2428	2.30	+ 155	+0.15
June	3.86	3.91	3.88	+0.04	+ 42	2416	2.28	2458	2.32	2432	2.30	+ 26	+0.02
July	3.90	3.89	3.93	-0.11	- 116	2428	2.30	2312	2.19	2418	2.29	- 106	-0.10
Aug.	3.79	3.69	3.65	-0.23	- 243	2357	2.23	2114	2.00	2406	2.28	- 292	-0.28
Sept.	3.56	3.44	3.46	-0.24	- 254	2307	2.18	2053	1.94	2403	2.27	- 350	-0.33
Oct.	3.32	3.21	3.29	-0.26	- 275	2267	2.14	1992	1.88	2364	2.24	- 372	-0.35
Nov.	3.06	2.92	3.11	-0.18	- 190	2222	2.10	2032	1.92	2298	2.17	- 266	-0.25
Dec.	2.88	2.83	3.21	-0.16	- 169	-2246	2.12	2077	1.96	2403	2.27	- 326	-0.31
1887													
Jan.	2.72	2.61	2.86	+0.10	+ 106	2161	2.04	2267	2.14	2289	2.16	- 22	-0.02
Feb.	2.82	3.04	3.07	+0.61	+ 645	2212	2.09	2857	2.70	2253	2.13	+ 604	+0.57
Mar.	3.43	3.82	3.75	+0.41	+ 434	2383	2.25	2817	2.66	1985	1.88	+ 832	+0.79
April	3.84	3.87	3.71	+0.12	+ 127	2372	2.24	2499	2.36	2133	2.02	+ 366	+0.35
May	3.96	4.05	3.93	+0.10	+ 106	+2427	2.30	2533	2.40	2202	2.08	+ 331	+0.31
June	4.06	4.07	4.07	-0.10	- 106	2465	2.33	2359	2.23	2261	2.14	+ 98	+0.09
July	3.96	3.84	3.91	-0.28	- 296	2423	2.29	2127	2.01	2319	2.19	- 192	-0.18
Aug.	3.68	3.52	3.51	-0.28	- 296	2322	2.20	2026	1.92	2316	2.19	- 290	-0.27
Sept.	3.40	3.29	3.20	-0.40	- 423	2244	2.12	1821	1.72	2233	2.11	- 412	-0.39
Oct.	3.00	2.70	3.26	-0.44	- 465	2258	2.14	1793	1.70	2217	2.10	- 424	-0.40
Nov.	2.56	2.43	2.71	-0.12	- 127	2125	2.01	1998	1.89	2109	1.99	- 111	-0.10
Dec.	2.44	2.45	2.89	-0.08	- 85	2170	2.05	2085	1.97	2016	1.91	+ 69	+0.07
1888													
Jan.	2.36	2.27	2.57	-0.22	- 233	2094	1.98	1861	1.76	2090	1.98	- 229	-0.22
Feb.	2.14	2.00	1.96	-0.09	- 95	1954	1.85	1859	1.76	2086	1.97	- 227	-0.21
Mar.	2.05	2.10	2.03	+0.37	+ 391	1971	1.86	2362	2.23	1922	1.82	+ 440	+0.42
April	2.42	2.73	2.69	+0.44	+ 465	2121	2.01	2586	2.45	2104	1.99	+ 482	+0.46
May	2.86	2.98	2.84	+0.18	+ 190	2157	2.04	2347	2.22	2036	1.93	+ 311	+0.29
June	3.04	3.11	3.01	+0.14	+ 148	2197	2.08	2345	2.22	2120	2.00	+ 225	+0.21
July	3.18	3.26	3.23	+0.03	+ 32	2251	2.13	2283	2.16	2208	2.09	+ 75	+0.07
Aug.	3.21	3.16	3.12	-0.27	- 286	2225	2.10	1939	1.83	2177	2.06	- 238	-0.23
Sept.	2.94	2.72	2.78	-0.40	- 423	2142	2.03	1719	1.63	2186	2.07	- 467	-0.44
Oct.	2.54	2.35	2.59	-0.16	- 169	2098	1.98	1929	1.82	2131	2.02	- 202	-0.19
Nov.	2.38	2.41	2.44	-0.03	- 32	2064	1.95	2032	1.92	2079	1.97	- 47	-0.04
Dec.	2.35	2.29	2.74	-0.05	- 53	2133	2.02	2080	1.97	1992	1.88	+ 88	+0.08
1889													
Jan.	2.30	2.31	2.56	-0.07	- 74	2091	1.98	2017	1.91	2099	1.99	- 82	-0.08
Feb.	2.23	2.15	2.34	-0.16	- 169	2041	1.93	1872	1.77	1701	1.61	+ 171	-0.16
Mar.	2.07	1.99	1.95	+0.09	+ 95	1952	1.85	2047	1.94	1716	1.62	+ 331	+0.31
April	2.16	2.24	3.33	+0.27	+ 286	2038	1.93	2324	2.20	1792	1.69	+ 532	+0.50
May	2.43	2.52	2.49	+0.31	+ 328	2075	1.96	2403	2.27	1934	1.83	+ 469	+0.44
June	2.74	2.95	2.96	+0.31	+ 328	2186	2.07	2514	2.38	2100	1.99	+ 414	+0.39
July	3.05	3.15	3.00	-0.05	- 53	2196	2.08	2143	2.03	2086	1.97	+ 57	+0.05
Aug.	3.00	2.84	2.91	-0.36	- 381	2174	2.06	1793	1.70	2097	1.98	- 304	-0.29
Sept.	2.64	2.45	2.53	-0.40	- 423	2084	1.97	1661	1.57	2113	2.00	- 452	-0.43
Oct.	2.24	2.03	2.03	-0.34	- 360	1970	1.86	1610	1.52	2020	1.91	- 410	-0.39
Nov.	1.90	1.76	2.03	-0.01	- 11	1970	1.86	1959	1.85	1988	1.88	- 29	-0.03
Dec.	1.89	2.02	2.34	+0.31	+ 328	2041	1.93	2369	2.24	1817	1.72	+ 552	+0.52

a.—Discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
b.—St. Clair River discharge used.

SESSIONAL PAPER No. 54.

TABLE 26.—Continued.
SUPPLY FACTORS OF LAKE ERIE.

DATE	WATER LEVELS OF LAKE ERIE			STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER. <i>a</i>		TOTAL SUPPLY TO LAKE ERIE		INFLOW FROM DETROIT RIVER		LOCAL SUPPLY TO LAKE ERIE.	
	CLEVELAND, O.		Buffalo, N.Y. Mean of Month.	Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Feet Depth.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Foot Depth.
	First of Month	Mean of Month.											
1890													
Jan.	572.20	572.38	572.93	+0.32	+ 338	2178	2.06	2516	2.38	1940	1.83	+ 576	+0.54
Feb.	2.52	2.67	2.74	+0.21	+ 222	2133	2.02	2355	2.23	1797	1.70	+ 558	+0.53
Mar.	2.73	2.79	2.98	+0.31	+ 328	2191	2.07	2519	2.38	1745	1.65	+ 774	+0.73
April	3.04	3.28	3.23	+0.41	+ 434	2251	2.13	2685	2.54	1823	1.72	+ 862	+0.82
May	3.45	3.62	3.59	+0.35	+ 370	2342	2.21	2712	2.56	1839	1.74	+ 873	+0.83
June	3.80	3.99	3.92	0.00	0	2426	2.29	2426	2.29	1964	1.86	+ 462	+0.44
July	3.80	3.61	3.64	-0.42	- 444	2354	2.23	1910	1.81	2046	1.93	- 136	-0.13
Aug.	3.38	3.15	3.17	-0.32	- 338	2237	2.12	1899	1.80	2066	1.95	- 167	-0.16
Sept.	3.06	2.98	2.82	-0.18	- 190	2152	2.04	1962	1.86	1994	1.89	- 32	-0.03
Oct.	2.88	2.79	2.81	-0.10	- 106	2150	2.03	2044	1.93	1919	1.81	+ 125	+0.12
Nov.	2.78	2.76	3.00	-0.14	- 148	2196	2.08	2048	1.94	1950	1.84	+ 98	+0.09
Dec.	2.64	2.53	2.74	-0.22	- 233	2133	2.02	1900	1.80	1875	1.77	+ 25	+0.02
1891													
Jan.	2.42	2.31	2.48	-0.12	- 127	2072	1.96	1945	1.84	1718	1.62	- 227	+0.22
Feb.	2.30	2.29	2.36	+0.22	+ 233	2046	1.93	2279	2.16	1809	1.71	- 470	+0.44
Mar.	2.52	2.75	2.50	+0.16	+ 169	2077	1.96	2246	2.12	1534	1.45	+ 712	+0.67
April	2.68	2.62	2.62	-0.15	- 159	2106	1.99	1947	1.84	1830	1.73	- 117	+0.11
May	2.53	2.44	2.40	-0.02	- 21	2054	1.94	2033	1.92	1865	1.76	+ 168	+0.16
June	2.51	2.58	2.38	+0.02	+ 21	2050	1.94	2071	1.96	1885	1.78	- 186	+0.18
July	2.53	2.48	2.56	-0.19	- 201	2091	1.98	1890	1.79	1931	1.83	- 41	-0.04
Aug.	2.34	2.21	2.27	-0.22	- 233	2025	1.92	1792	1.69	1952	1.85	- 160	-0.15
Sept.	2.12	2.03	2.10	-0.28	- 296	1986	1.88	1690	1.60	1943	1.84	- 253	-0.24
Oct.	1.84	1.65	1.73	-0.41	- 434	1903	1.80	1469	1.39	1878	1.78	- 409	-0.39
Nov.	1.43	1.21	1.67	-0.19	- 201	1891	1.79	1690	1.60	1912	1.81	- 222	-0.21
Dec.	1.24	1.28	1.70	+0.06	+ 63	1897	1.79	1960	1.85	1873	1.77	- 87	+0.08
1892													
Jan.	1.30	1.31	1.61	-0.10	- 106	1878	1.78	1772	1.68	1683	1.59	+ 89	+0.08
Feb.	2.20	1.10	0.92	-0.08	- 85	1733	1.64	1648	1.56	1425	1.35	- 223	+0.21
Mar.	1.12	1.14	1.12	+0.30	+ 317	1775	1.68	2092	1.98	1508	1.43	+ 584	+0.55
April	1.42	1.70	1.96	+0.68	+ 719	1954	1.85	2673	2.53	1767	1.67	+ 906	+0.86
May	2.10	2.50	2.40	+0.78	+ 825	2054	1.94	2879	2.72	1787	1.69	+1092	+1.03
June	2.88	3.26	3.21	+0.44	+ 465	2246	2.12	2711	2.56	1864	1.76	+ 847	+0.80
July	3.32	3.38	3.42	-0.12	- 127	2299	2.17	2172	2.05	1908	1.80	- 264	+0.25
Aug.	3.20	3.03	3.05	-0.33	- 349	2208	2.09	1859	1.76	1926	1.82	- 67	-0.06
Sept.	2.87	2.71	2.78	-0.44	- 465	2143	2.03	1678	1.59	1981	1.87	- 303	-0.29
Oct.	2.43	2.15	2.45	-0.45	- 476	2066	1.95	1590	1.50	1905	1.80	- 315	-0.30
Nov.	1.98	1.82	2.07	-0.30	- 317	1978	1.87	1661	1.57	1843	1.74	- 182	-0.17
Dec.	1.68	1.55	2.04	-0.32	- 338	1973	1.87	1635	1.55	1753	1.66	118	-0.11
1893													
Jan.	1.36	1.17	1.27	-0.15	- 159	1806	1.71	1647	1.56	1464	1.38	+ 183	+0.17
Feb.	1.21	1.25	1.22	+0.15	+ 159	1796	1.70	1955	1.85	1514	1.43	+ 441	+0.42
Mar.	1.36	1.47	1.53	+0.48	+ 508	1861	1.76	2369	2.24	1851	1.75	+ 518	+0.49
April	1.84	2.20	2.19	+0.78	+ 825	2006	1.90	2831	2.68	1883	1.78	- 948	+0.90
May	2.62	3.04	2.91	+0.52	+ 550	2174	2.06	2724	2.58	1817	1.72	- 907	+0.86
June	3.14	3.23	3.26	-0.05	- 53	2258	2.14	2205	2.09	1950	1.84	- 255	+0.24
July	3.09	2.95	3.13	-0.31	- 328	2224	2.10	1896	1.79	2047	1.94	- 151	-0.14
Aug.	2.78	2.61	2.54	-0.36	- 381	2086	1.97	1705	1.61	2052	1.94	- 347	-0.33
Sept.	2.42	2.23	2.29	-0.36	- 381	2028	1.92	1647	1.56	2034	1.92	- 387	-0.37
Oct.	2.06	1.88	2.19	-0.38	- 402	2006	1.90	1604	1.52	1988	1.88	- 384	-0.36
Nov.	1.68	1.48	2.17	-0.16	- 169	2001	-1.89	1832	1.73	1990	1.88	- 158	-0.15
Dec.	1.52	1.56	2.13	+0.18	- 190	1993	1.88	2183	2.06	1958	1.85	- 225	+0.21
1894													
Jan.	1.70	1.84	2.13	+0.08	+ 85	1993	1.88	2078	1.97	1876	1.77	+ 202	+0.19
Feb.	1.78	1.72	1.75	-0.04	- 42	1908	1.80	1866	1.76	1698	1.61	+ 168	+0.16
Mar.	1.74	1.75	1.86	+0.21	+ 222	1931	1.83	2153	2.04	1877	1.78	+ 276	+0.26
April	1.95	2.15	2.05	+0.39	+ 412	1974	1.87	2386	2.26	1867	1.77	+ 519	+0.49
May	2.34	2.54	2.55	+0.30	+ 317	2088	1.97	2405	2.27	1981	1.87	+ 424	+0.40
June	2.64	2.75	2.94	+0.10	+ 106	2181	2.06	2287	2.16	2045	1.93	+ 242	+0.23
July	2.74	2.73	2.81	-0.20	- 211	2150	2.03	1939	1.83	2048	1.94	- 109	-0.10
Aug.	2.54	2.36	2.34	-0.26	- 275	2040	1.93	1765	1.67	2051	1.94	- 286	-0.27
Sept.	2.28	2.19	2.17	-0.25	- 264	2002	1.89	1738	1.64	2026	1.92	- 288	-0.27
Oct.	2.03	1.87	2.17	-0.28	- 296	2002	1.89	1706	1.61	1971	1.86	- 265	-0.25
Nov.	1.75	1.63	1.99	-0.15	- 159	1962	1.86	1803	1.71	1952	1.85	- 149	-0.14
Dec.	1.60	1.56	1.82	-0.20	- 211	1923	1.82	1712	1.62	1882	1.78	- 170	-0.16

a.—Discharge values include flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
b.—St. Clair River discharge used.

TABLE 26.—Continued.

SUPPLY FACTORS OF LAKE ERIE.

DATE	WATER LEVELS OF LAKE ERIE			STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER. <i>a</i>		TOTAL SUPPLY TO LAKE ERIE		INFLOW FROM DETROIT RIVER		LOCAL SUPPLY TO LAKE ERIE.	
	CLEVELAND, O.		Buffalo, N.Y. Mean of Month.	Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Feet Depth.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Foot Depth.
	First of Month	Mean of Month.											
1895													
Jan.	571.40	571.23	571.69	−0.28	− 296	1896	1.79	1600	1.51	<i>b</i> 1878	1.78	− 278	−0.26
Feb.	1.12	1.00	1.00	−0.12	− 127	1749	1.65	1622	1.53	<i>b</i> 1842	1.74	− 220	−0.21
Mar.	1.00	1.01	0.92	+0.14	+ 148	1733	1.64	1881	1.78	1988	1.88	− 107	−0.10
April	1.14	1.26	1.13	+0.23	+ 243	1777	1.68	2020	1.91	1732	1.64	+ 288	+0.27
May	1.37	1.48	1.48	+0.15	+ 159	1850	1.75	2009	1.90	1814	1.72	+ 195	+0.18
June	1.52	1.57	1.58	0.00	0	1872	1.77	1872	1.77	1861	1.76	+ 11	+0.01
July	1.52	1.46	1.56	−0.10	− 106	1867	1.77	1761	1.67	1898	1.79	− 137	−0.13
Aug.	1.42	1.38	1.42	−0.09	− 95	1838	1.74	1743	1.65	1895	1.79	− 152	−0.14
Sept.	1.33	1.28	1.44	−0.29	− 307	1842	1.74	1535	1.45	1868	1.77	− 333	−0.31
Oct.	1.04	0.80	1.20	−0.29	− 307	1792	1.69	1485	1.40	1794	1.70	− 309	−0.29
Nov.	0.75	0.70	0.71	+0.03	+ 32	1691	1.60	1723	1.63	1722	1.63	+ 1	0.00
Dec.	0.78	0.86	0.97	+0.13	+ 137	1744	1.65	1881	1.78	1748	1.65	+ 133	+0.13
1896													
Jan.	0.91	0.96	1.12	+0.01	+ 11	1775	1.68	1786	1.69	1736	1.64	+ 50	+0.05
Feb.	0.92	0.88	1.05	−0.06	− 63	1760	1.66	1697	1.60	1410	1.33	+ 287	+0.27
Mar.	0.86	0.83	0.69	+0.20	+ 211	1687	1.60	1898	1.79	1540	1.46	+ 358	+0.34
April	1.06	1.28	1.22	+0.41	+ 434	1796	1.70	2230	2.11	1681	1.59	+ 549	+0.52
May	1.47	1.66	1.67	+0.33	+ 349	1891	1.79	2240	2.12	1688	1.60	+ 552	+0.52
June	1.80	1.93	1.68	+0.07	+ 74	1893	1.79	1967	1.86	1791	1.69	+ 176	+0.17
July	1.87	1.81	1.86	+0.05	+ 53	1932	1.83	1985	1.88	1888	1.79	+ 97	+0.09
Aug.	1.92	2.02	2.09	−0.06	− 63	1983	1.88	1920	1.82	1898	1.79	+ 22	+0.02
Sept.	1.86	1.70	1.67	−0.28	− 296	1891	1.79	1595	1.51	1837	1.74	− 242	−0.23
Oct.	1.58	1.46	1.41	−0.30	− 317	1836	1.74	1519	1.44	1842	1.74	− 323	−0.31
Nov.	1.28	1.09	1.44	−0.18	− 190	1842	1.74	1652	1.56	1840	1.74	− 188	−0.18
Dec.	1.10	1.12	1.23	0.00	0	1797	1.70	1797	1.70	1683	1.59	+ 114	+0.11
1897													
Jan.	1.10	1.09	1.59	+0.09	+ 95	1875	1.77	1970	1.86	1925	1.82	+ 45	+0.04
Feb.	1.19	1.29	1.15	+0.29	+ 307	1781	1.68	2088	1.97	<i>b</i> 1784	1.69	+ 304	+0.29
Mar.	1.48	1.66	1.66	+0.46	+ 486	1888	1.79	2374	2.25	1907	1.80	+ 467	+0.44
April	1.94	2.21	2.18	+0.44	+ 465	2004	1.90	2469	2.33	1849	1.75	+ 620	+0.59
May	2.38	2.54	2.60	+0.21	+ 222	2101	1.99	2323	2.20	1950	1.84	+ 373	+0.35
June	2.59	2.64	2.59	+0.05	+ 53	2097	1.98	2150	2.03	1871	1.77	+ 279	+0.26
July	2.64	2.63	2.57	−0.09	− 95	2093	1.98	1998	1.89	1931	1.83	+ 67	+0.06
Aug.	2.55	2.47	2.45	−0.22	− 233	2066	1.95	1833	1.73	1932	1.83	− 99	−0.09
Sept.	2.33	2.19	2.09	−0.39	− 412	1984	1.88	1572	1.49	1926	1.82	− 354	−0.33
Oct.	1.94	1.70	1.65	−0.30	− 317	1886	1.78	1569	1.48	1898	1.79	− 329	−0.31
Nov.	1.64	1.57	1.69	−0.08	− 85	1895	1.79	1810	1.71	1916	1.81	− 106	−0.10
Dec.	1.56	1.54	1.81	0.00	0	1921	1.82	1921	1.82	1807	1.71	+ 114	+0.11
1898													
Jan.	1.56	1.59	1.68	+0.13	+ 137	1893	1.79	2030	1.92	1756	1.66	+ 274	+0.26
Feb.	1.69	1.79	1.57	+0.23	+ 243	1870	1.77	2113	2.00	1482	1.40	+ 631	+0.60
Mar.	1.92	2.05	1.95	+0.42	+ 444	1951	1.85	2395	2.26	1888	1.79	+ 507	+0.48
April	2.34	2.63	2.55	+0.36	+ 381	2088	1.97	2469	2.33	1848	1.75	+ 621	+0.59
May	2.70	2.78	2.68	+0.10	+ 106	2119	2.00	2225	2.10	1818	1.72	+ 407	+0.38
June	2.80	2.81	2.72	−0.10	− 106	2128	2.01	2022	1.91	1893	1.79	+ 129	+0.12
July	2.70	2.59	2.50	−0.21	− 222	2077	1.96	1855	1.75	1986	1.88	− 131	−0.12
Aug.	2.49	2.39	2.46	−0.29	− 307	2068	1.96	1761	1.67	1931	1.83	− 170	−0.16
Sept.	2.20	2.01	2.08	−0.29	− 307	1981	1.87	1674	1.58	1964	1.86	− 290	−0.27
Oct.	1.91	1.81	1.91	−0.16	− 169	1943	1.84	1774	1.68	1896	1.79	− 122	−0.12
Nov.	1.75	1.69	2.01	−0.15	− 159	1965	1.86	1806	1.71	1969	1.86	− 163	−0.15
Dec.	1.60	1.52	2.07	0.00	0	1978	1.87	1978	1.87	1996	1.89	− 18	−0.02
1899													
Jan.	1.60	1.67	2.05	−0.04	− 42	1974	1.87	1932	1.83	1947	1.84	− 15	−0.01
Feb.	1.56	1.46	1.59	+0.08	+ 85	1875	1.77	1960	1.85	<i>b</i> 1856	1.76	+ 104	+0.10
Mar.	1.64	1.83	1.85	+0.34	+ 360	1929	1.82	2289	2.16	1366	1.29	+ 923	+0.87
April	1.98	2.13	2.04	+0.30	+ 317	1973	1.87	2290	2.17	1655	1.57	+ 635	+0.60
May	2.28	2.44	2.32	+0.22	+ 233	2036	1.93	2269	2.15	1812	1.71	+ 457	+0.43
June	2.50	2.56	2.51	−0.08	− 85	2079	1.97	1994	1.89	1935	1.83	+ 59	+0.06
July	2.42	2.28	2.45	−0.24	− 254	2066	1.95	1812	1.71	2022	1.91	− 210	−0.20
Aug.	2.18	2.09	2.09	−0.21	− 222	1983	1.88	1761	1.67	2031	1.92	− 270	−0.26
Sept.	1.97	1.85	1.90	−0.24	− 254	1941	1.84	1687	1.60	2015	1.91	− 328	−0.31
Oct.	1.73	1.61	1.48	−0.11	− 116	1850	1.75	1734	1.64	1923	1.82	− 189	−0.18
Nov.	1.62	1.62	1.55	−0.14	− 148	1866	1.76	1718	1.62	1883	1.78	− 165	−0.16
Dec.	1.48	1.34	1.96	−0.13	− 137	1954	1.85	1817	1.72	1822	1.72	− 5	0.00

a.—Discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
b.—St. Clair River discharge used.

SESSIONAL PAPER No. 54.

TABLE 26.—Continued.

SUPPLY FACTORS OF LAKE ERIE.

DATE	WATER LEVELS OF LAKE ERIE			STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER. <i>a</i>		TOTAL SUPPLY TO LAKE ERIE		INFLOW FROM DETROIT RIVER		LOCAL SUPPLY TO LAKE ERIE.	
	CLEVELAND, O.		Buffalo, N.Y. Mean of Month.	Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Feet Depth.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Foot Depth.
	First of Month	Mean of Month.											
1900													
Jan.	571.35	571.36	571.67	+0.11	+ 116	1891	1.79	2007	1.90	1736	1.64	+ 271	+0.26
Feb.	1.46	1.57	1.61	+0.28	+ 296	1878	1.78	2174	2.06	1778	1.68	+ 396	+0.37
Mar.	1.74	1.92	1.82	+0.34	+ 360	1923	1.82	2283	2.16	1874	1.77	+ 409	+0.39
April	2.08	2.23	2.16	+0.23	+ 243	1999	1.89	2242	2.12	1780	1.68	+ 462	+0.44
May	2.31	2.39	2.33	+0.12	+ 127	2038	1.93	2165	2.05	1796	1.70	+ 369	+0.35
June	2.43	2.47	2.41	-0.03	- 32	2056	1.94	2024	1.91	1868	1.77	+ 156	+0.15
July	2.40	2.34	2.43	-0.08	- 85	2061	1.95	1976	1.87	1932	1.83	+ 44	+0.04
Aug.	2.32	2.31	2.31	-0.17	- 180	2034	1.92	1854	1.75	1957	1.85	- 103	-0.10
Sept.	2.15	1.99	2.07	-0.28	- 296	1978	1.87	1682	1.59	1978	1.87	- 296	-0.28
Oct.	1.87	1.75	1.68	-0.25	- 264	1893	1.79	1629	1.54	1953	1.85	- 324	-0.31
Nov.	1.62	1.49	1.84	-0.15	- 159	1927	1.82	1768	1.67	1974	1.87	- 206	-0.19
Dec.	1.47	1.45	1.77	-0.07	- 74	1912	1.81	1838	1.74	1911	1.81	- 73	-0.07
1901													
Jan.	1.40	1.35	1.60	-0.22	- 233	1876	1.77	1643	1.55	1719	1.63	- 76	-0.07
Feb.	1.18	1.00	1.03	-0.24	- 254	1755	1.66	1501	1.42	1410	1.33	+ 91	+0.09
Mar.	0.94	0.88	0.82	+0.14	+ 148	1712	1.62	1860	1.76	1548	1.46	+ 312	+0.30
April	1.08	1.29	1.05	+0.22	+ 233	1760	1.66	1993	1.88	1161	1.10	+ 832	+0.79
May	1.30	1.31	1.17	+0.22	+ 233	1786	1.69	2019	1.91	1706	1.61	+ 313	+0.30
June	1.52	1.72	1.69	+0.30	+ 317	1896	1.79	2213	2.09	1986	1.88	+ 227	+0.21
July	1.82	1.91	1.88	+0.02	+ 21	1936	1.83	1957	1.85	2052	1.94	- 95	-0.09
Aug.	1.84	1.78	1.70	-0.10	- 106	1897	1.79	1791	1.69	2084	1.97	- 293	-0.28
Sept.	1.74	1.71	1.75	-0.22	- 233	1908	1.80	1675	1.58	2025	1.92	- 350	-0.33
Oct.	1.52	1.33	1.53	-0.28	- 296	1861	1.76	1565	1.48	1983	1.88	- 418	-0.40
Nov.	1.24	1.16	1.39	-0.06	- 63	1831	1.73	1768	1.67	1963	1.86	- 195	-0.18
Dec.	1.18	1.19	1.37	-0.04	- 42	1827	1.73	1785	1.69	1935	1.83	- 150	-0.14
1902													
Jan.	1.14	1.08	1.41	-0.28	- 296	1836	1.74	1540	1.46	1522	1.44	+ 18	+0.02
Feb.	0.86	0.63	0.79	-0.08	- 85	1706	1.61	1621	1.53	1464	1.38	+ 157	+0.15
Mar.	0.78	0.94	0.95	+0.44	+ 465	1739	1.64	2204	2.08	1827	1.73	+ 377	+0.36
April	1.22	1.49	1.50	+0.46	+ 486	1855	1.75	2341	2.21	1816	1.72	+ 525	+0.50
May	1.68	1.86	1.74	+0.31	+ 328	1906	1.80	2234	2.11	1818	1.72	+ 416	+0.39
June	1.99	2.12	2.05	+0.44	+ 465	1975	1.87	2440	2.31	1936	1.83	+ 504	+0.48
July	2.43	2.74	2.73	+0.30	+ 317	2130	2.01	2447	2.31	2054	1.94	+ 393	+0.37
Aug.	2.73	2.72	2.64	-0.18	- 190	2110	2.00	1920	1.82	2003	1.89	- 83	-0.08
Sept.	2.55	2.38	2.30	-0.21	- 222	2031	1.92	1809	1.71	1944	1.84	- 135	-0.13
Oct.	2.34	2.29	2.39	-0.18	- 190	2053	1.94	1863	1.76	1905	1.80	- 42	-0.04
Nov.	2.16	2.02	2.14	-0.24	- 254	1995	1.89	1741	1.65	1846	1.75	- 105	-0.10
Dec.	1.92	1.82	2.20	-0.15	- 159	2009	1.90	1850	1.75	1919	1.81	- 69	-0.07
1903													
Jan.	1.77	1.72	1.99	-0.06	- 63	1961	1.85	1898	1.79	1988	1.88	- 90	-0.09
Feb.	1.71	1.70	1.70	+0.28	+ 296	1897	1.79	2193	2.07	1851	1.75	+ 342	+0.32
Mar.	1.99	2.28	2.13	+0.67	+ 708	1992	1.88	2700	2.55	1837	1.74	+ 863	+0.82
April	2.66	3.05	2.83	+0.41	+ 434	2154	2.04	2588	2.45	1879	1.78	+ 709	+0.67
May	3.07	3.09	2.85	0.00	0	2159	2.04	2159	2.04	1803	1.71	+ 356	+0.34
June	3.07	3.05	2.95	-0.05	- 53	2184	2.07	2131	2.02	1911	1.81	+ 220	+0.21
July	3.02	2.98	2.99	-0.15	- 159	2194	2.07	2035	1.92	1958	1.85	+ 77	+0.17
Aug.	2.87	2.76	2.64	-0.19	- 201	2110	2.00	1909	1.81	1978	1.87	- 69	-0.07
Sept.	2.68	2.59	2.55	-0.26	- 275	2088	1.97	1813	1.71	1997	1.89	- 184	-0.17
Oct.	2.42	2.25	2.36	-0.41	- 434	2045	1.93	1611	1.52	1999	1.89	- 388	-0.37
Nov.	2.01	1.77	2.01	-0.47	- 497	1966	1.86	1469	1.39	1910	1.81	- 441	-0.42
Dec.	1.54	1.31	2.02	-0.29	- 307	1968	1.86	1661	1.57	2138	2.02	- 477	-0.45
1904													
Jan.	1.25	1.19	1.06	-0.01	- 11	1762	1.67	1751	1.66	1612	1.52	+ 139	+0.13
Feb.	1.24	1.28	1.30	+0.33	+ 349	1813	1.71	2162	2.04	1682	1.59	+ 480	+0.45
Mar.	1.57	1.86	1.86	+0.81	+ 857	1931	1.83	2788	2.64	^b 1825	1.73	+ 963	+0.91
April	2.38	2.91	2.89	+0.66	+ 698	2170	2.05	2868	2.71	2035	1.92	+ 833	+0.79
May	3.04	3.17	3.23	+0.20	+ 211	2252	2.13	2463	2.33	1902	1.80	+ 561	+0.53
June	3.24	3.32	3.49	+0.12	+ 127	2317	2.19	2444	2.31	2031	1.92	+ 413	+0.39
July	3.36	3.41	3.41	-0.10	- 106	2296	2.17	2190	2.07	2083	1.97	+ 107	+0.10
Aug.	3.26	3.10	3.12	-0.29	- 307	2225	2.10	1918	1.81	2103	1.99	- 185	-0.17
Sept.	2.97	2.84	2.84	-0.31	- 328	2157	2.04	1829	1.73	2079	1.97	- 250	-0.25
Oct.	2.66	2.49	2.61	-0.36	- 381	2103	1.99	1722	1.63	2035	1.92	- 313	-0.39
Nov.	2.30	2.12	2.31	-0.36	- 381	2033	1.92	1652	1.56	1992	1.88	- 340	-0.32
Dec.	1.94	1.77	2.13	-0.30	- 317	1993	1.88	1676	1.58	2019	1.91	- 343	-0.32

a.—Discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
b.—St. Clair River discharge used.

TABLE 26.—Continued.

SUPPLY FACTORS OF LAKE ERIE.

DATE	WATER LEVELS OF LAKE ERIE			STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER. <i>a</i>		TOTAL SUPPLY TO LAKE ERIE		INFLOW FROM DETROIT RIVER		LOCAL SUPPLY TO LAKE ERIE.	
	CLEVELAND, O.		Buffalo, N.Y. Mean of Month.	Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Feet Depth.	100 c.f.s.	Feet Depth, Lake Erie.	100 c.f.s.	Foot Depth.
	First of Month	Mean of Month.											
1905													
Jan.	571.64	571.52	571.74	−0.22	− 233	1906	1.80	1673	1.58	1580	1.49	+ 93	+0.09
Feb.	1.42	1.31	1.23	−0.18	− 190	1797	1.70	1607	1.52	1534	1.45	+ 73	+0.07
Mar.	1.24	1.18	1.32	+0.26	+ 275	1816	1.72	2091	1.98	1676	1.58	+ 415	+0.39
April	1.50	1.83	1.79	+0.64	+ 677	1917	1.81	2594	2.45	1947	1.84	+ 647	+0.61
May	2.14	2.46	2.38	+0.58	+ 613	2049	1.94	2662	2.52	1922	1.82	+ 740	+0.70
June	2.72	2.98	2.97	+0.30	+ 317	2188	2.07	2505	2.37	2066	1.95	+ 439	+0.42
July	3.02	3.06	3.28	−0.06	− 63	2264	2.14	2201	2.08	2118	2.00	+ 83	+0.08
Aug.	2.96	2.87	3.06	−0.21	− 222	2209	2.09	1987	1.88	2124	2.01	− 137	−0.13
Sept.	2.75	2.63	2.86	−0.28	− 296	2161	2.04	1865	1.76	2094	1.98	− 229	−0.22
Oct.	2.47	2.31	2.65	−0.35	− 370	2112	2.00	1742	1.65	2052	1.94	− 310	−0.29
Nov.	2.12	1.93	2.29	−0.20	− 211	2029	1.92	1818	1.72	2004	1.90	− 186	−0.18
Dec.	1.92	1.92	2.45	+0.01	+ 11	2066	1.95	2077	1.96	1942	1.84	+ 135	+0.13
1906													
Jan.	1.93	1.94	2.33	+0.01	+ 11	2038	1.93	2049	1.94	1991	1.88	+ 58	+0.05
Feb.	1.94	1.93	1.88	−0.12	− 127	1936	1.83	1809	1.71	1548	1.46	+ 261	+0.25
Mar.	1.82	1.71	1.66	+0.10	+ 106	1889	1.79	1995	1.89	1600	1.51	+ 395	+0.37
April	1.92	2.13	2.06	+0.34	+ 360	1977	1.87	2337	2.21	1905	1.80	+ 432	+0.41
May	2.26	2.40	2.27	+0.24	+ 254	2025	1.92	2279	2.16	1993	1.88	+ 286	+0.27
June	2.50	2.60	2.49	+0.12	+ 127	2075	1.96	2202	2.08	2034	1.92	+ 168	+0.16
July	2.62	2.64	2.56	+0.02	+ 21	2091	1.98	2112	2.00	2089	1.98	+ 23	+0.02
Aug.	2.64	2.63	2.51	−0.15	− 159	2078	1.97	1919	1.81	2082	1.97	− 163	−0.15
Sept.	2.49	2.35	2.27	−0.21	− 222	2025	1.92	1803	1.71	2039	1.93	− 236	−0.22
Oct.	2.28	2.21	2.25	−0.08	− 28	2020	1.91	1935	1.83	2021	1.91	− 86	−0.08
Nov.	2.20	2.18	2.32	+0.10	+ 106	2036	1.93	2142	2.03	1994	1.89	+ 148	+0.14
Dec.	2.30	2.42	2.45	+0.29	+ 307	2066	1.95	2373	2.24	1895	1.79	+ 478	+0.45
1907													
Jan.	2.59	2.76	2.96	+0.02	+ 21	2185	2.07	2206	2.09	1779	1.68	+ 427	+0.40
Feb.	2.61	2.46	2.47	−0.26	− 275	2070	1.96	1795	1.70	1711	1.62	+ 84	+0.08
Mar.	2.35	2.24	2.22	+0.13	+ 137	2014	1.90	2151	2.03	1749	1.65	+ 402	+0.38
April	2.48	2.71	2.62	+0.30	+ 317	2105	1.99	2422	2.29	1931	1.83	+ 491	+0.46
May	2.78	2.85	2.84	+0.28	+ 296	2157	2.04	2453	2.32	1962	1.86	+ 491	+0.46
June	3.06	3.27	3.18	+0.23	+ 243	2239	2.12	2482	2.35	1990	1.88	+ 492	+0.47
July	3.29	3.31	3.33	−0.12	− 127	2276	2.15	2149	2.03	2075	1.96	+ 74	+0.07
Aug.	3.17	3.03	3.02	−0.27	− 286	2200	2.08	1914	1.81	2028	1.92	− 114	−0.11
Sept.	2.90	2.77	2.80	−0.17	− 180	2148	2.03	1968	1.86	2047	1.94	− 79	−0.07
Oct.	2.73	2.69	2.79	−0.18	− 190	2145	2.03	1955	1.85	2017	1.91	− 62	−0.06
Nov.	2.55	2.41	2.71	−0.21	− 222	2126	2.01	1904	1.80	1961	1.85	− 57	−0.05
Dec.	2.34	2.26	2.63			2108	1.99			1952	1.85		

a.—Discharge values include a flow of 1,000 c.f.s. through Erie Canal and 1,100 c.f.s. through Welland Canal.

b.—St. Clair River discharge used.

SESSIONAL PAPER No. 54.

TABLE 27.

SUPPLY FACTORS OF LAKE ONTARIO.

DATE	WATER LEVELS OF—				STORAGE IN LAKE ONTARIO		OUTFLOW THROUGH ST. LAWRENCE RIVER		TOTAL SUPPLY TO LAKE ONTARIO		INFLOW FROM NIAGARA RIVER. <i>a</i>		LOCAL SUPPLY TO LAKE ONTARIO	
	LAKE ONTARIO		ST. LAWRENCE RIVER.											
	OSWEGO, N.Y.		Ogdens- burg, N.Y., Mean of Month.	Lock 27, Head of Galop Canal, Mean of Month.										
	First of Month.	Mean of Month.			Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Ontario.	100 c.f.s.	Feet Depth	100 c.f.s.	Feet Depth, Lake Ontario	100 c.f.s.	Foot Depth.
1860														
Jan.		246.58	245.65	244.08			2629	3.42			2321	3.02		
Feb.	246.65	6.72	5.78	4.22	+0.09	+ 69	2661	3.46	2730	3.55	2178	2.83	552	0.72
Mar.	6.74	6.77	5.83	4.26	+0.04	+ 31	2689	3.50	2720	3.54	2265	2.95	455	0.59
April	6.78	6.80	5.86	4.29	+0.14	+ 108	2699	3.51	2807	3.65	2423	3.15	384	0.50
May	6.92	7.03	6.07	4.80	+0.38	+ 292	2883	3.75	3175	4 13	2475	3.22	700	0.91
June	7.30	7.57	6.58	5.31	+0.40	+ 307	3062	3.99	3369	4.39	2486	3.24	883	1.15
July	7.70	7.82	6.82	5.55	-0.16	- 123	3146	4.09	3023	3.93	2436	3.17	587	0.76
Aug.	7.54	7.26	6.29	5.02	-0.48	- 369	2960	3.85	2591	3.37	2375	3.09	216	0.28
Sept.	7.06	6.86	5.91	4.64	-0.30	- 231	2827	3.68	2596	3.38	2304	3.00	292	0.38
Oct.	6.76	6.67	5.73	4.46	-0.05	- 38	2767	3.60	2729	3.55	2244	2.92	485	0.63
Nov.	6.71	6.75	5.81	4.54	+0.03	+ 23	2794	3.64	2817	3.67	2248	2.93	569	0.74
Dec.	6.74	6.73	5.79	4.22	-0.16	- 123	2676	3.48	2553	3.32	2256	2.94	297	0.38
1861														
Jan.	6.58	6.44	5.52	3.95	-0.08	- 62	2587	3.37	2525	3.29	2161	2.81	364	0.48
Feb.	6.50	6.56	5.63	4.07	+0.28	+ 215	2615	3.40	2830	3.68	2045	2.66	785	1.02
Mar.	6.78	7.01	6.05	4.49	+0.34	+ 261	2754	3.58	3015	3.92	2136	2.78	879	1.14
April	7.12	7.23	6.26	4.70	+0.58	+ 446	2826	3.68	3272	4.26	2375	3.09	897	1.17
May	7.70	8.18	7.16	5.89	+0.66	+ 507	3267	4.25	3774	4.91	2485	3.23	1289	1.68
June	8.36	8.54	7.50	6.23	+0.07	+ 54	3390	4.41	3444	4.48	2521	3.28	923	1.20
July	8.43	8.32	7.29	6.02	-0.23	- 177	3313	4.31	3136	4.08	2474	3.22	662	0.86
Aug.	8.20	8.07	7.05	5.79	-0.36	- 277	3215	4.18	2938	3.82	2463	3.21	475	0.61
Sept.	7.84	7.60	6.61	5.34	-0.14	- 108	3072	4.00	2964	3.86	2431	3.16	533	0.70
Oct.	7.70	7.81	6.81	5.54	+0.12	+ 92	3141	4.09	3233	4.21	2387	3.11	846	1.10
Nov.	7.82	7.82	6.82	5.55	-0.10	- 77	3147	4.10	3070	4.00	2410	3.14	660	0.86
Dec.	7.72	7.61	6.62	5.06	-0.36	- 277	2949	3.84	2672	3.48	2401	3.12	271	0.36
1862														
Jan.	7.36	7.11	6.15	4.59	-0.46	- 353	2789	3.63	2436	3.17	2365	3.08	71	0.09
Feb.	6.90	6.69	5.75	4.19	+0.04	+ 31	2656	3.46	2687	3.50	2237	2.91	450	0.59
Mar.	6.94	7.18	6.21	4.65	+0.69	+ 530	2808	3.65	3338	4.34	2258	2.94	1080	4.40
April	7.63	8.08	7.06	5.50	+0.85	+ 653	3103	4.04	3756	4.89	2471	3.22	1285	1.67
May	8.48	8.88	7.82	6.55	+0.27	+ 208	3512	4.57	3720	4.84	2531	3.29	1189	1.55
June	8.75	8.62	7.57	6.31	-0.08	- 62	3404	4.43	3342	4.35	2551	3.32	791	1.03
July	8.67	8.72	7.67	6.40	-0.18	- 138	3454	4.50	3316	4.32	2562	3.33	754	0.99
Aug.	8.49	8.26	7.23	5.97	-0.55	- 423	3280	4.27	2857	3.72	2439	3.17	418	0.55
Sept.	7.94	7.61	6.62	5.35	-0.60	- 461	3075	4.00	2614	3.40	2375	3.09	239	0.31
Oct.	7.34	7.08	6.12	4.85	-0.44	- 338	2900	3.77	2562	3.33	2294	2.99	268	0.34
Nov.	6.90	6.73	5.79	4.52	-0.22	- 169	2788	3.63	2619	3.41	2237	2.91	382	0.50
Dec.	6.68	6.62	5.69	4.12	+0.02	+ 15	2642	3.44	2657	3.46	2291	2.98	366	0.48
1863														
Jan.	6.70	6.77	5.83	4.26	+0.10	+ 77	2689	3.50	2766	3.60	2372	3.09	394	0.51
Feb.	6.80	6.83	5.88	4.32	+0.07	+ 54	2698	3.51	2752	3.58	2390	3.11	362	0.47
Mar.	6.87	6.91	5.96	4.40	+0.40	+ 307	2725	3.55	3032	3.95	2361	3.07	671	0.88
April	7.27	7.63	6.64	5.08	+0.56	+ 430	2956	3.85	3386	4.41	2375	3.09	1011	1.32
May	7.83	8.03	7.02	5.75	+0.27	+ 208	3218	4.19	3426	4.46	2418	3.15	1008	1.31
June	8.10	8.18	7.16	5.89	-0.12	- 92	3267	4.25	3175	4.13	2400	3.12	775	1.01
July	7.98	7.77	6.77	5.50	-0.44	- 338	3128	4.07	2790	3.63	2387	3.11	403	0.52
Aug.	7.54	7.31	6.34	5.07	-0.42	- 323	2977	3.87	2654	3.45	2346	3.05	308	0.40
Sept.	7.12	6.93	5.98	4.71	-0.28	- 215	2850	3.71	2635	3.43	2264	2.95	371	0.48
Oct.	6.84	6.74	5.80	4.53	-0.19	- 146	2790	3.63	2644	3.44	2172	2.83	472	0.61
Nov.	6.65	6.56	5.63	4.36	-0.09	- 69	2732	3.56	2663	3.47	2101	2.73	562	0.74
Dec.	6.56	6.57	5.64	4.08	-0.11	- 84	2619	3.41	2535	3.30	2137	2.78	398	0.52
1864														
Jan.	6.45	6.33	5.41	3.85	-0.20	- 154	2544	3.31	2390	3.11	2041	2.66	348	0.45
Feb.	6.25	6.17	5.26	3.70	-0.03	- 23	2496	3.25	2473	3.22	2025	2.64	448	0.58
Mar.	6.22	6.26	5.35	3.78	+0.32	+ 246	2532	3.30	2778	3.62	2061	2.68	717	0.94
April	6.54	6.83	5.88	4.32	+0.78	+ 599	2698	3.51	3297	4.29	2157	2.81	1140	0.48
May	7.32	7.82	6.82	5.55	+0.65	+ 499	3146	4.09	3645	4.74	2332	3.04	1313	1.70
June	7.97	8.12	7.10	5.83	-0.01	- 8	3246	4.22	3238	4.21	2337	3.04	901	1.17
July	7.96	7.80	6.80	5.53	-0.39	- 300	3140	4.09	2840	3.70	2288	2.98	552	0.72
Aug.	7.57	7.34	6.37	5.10	-0.49	- 376	2989	3.89	2613	3.40	2203	2.87	410	0.53
Sept.	7.08	6.81	5.87	4.60	-0.38	- 292	2814	3.66	2522	3.28	2165	2.82	357	0.46
Oct.	6.70	6.58	5.65	4.38	-0.14	- 108	2740	3.57	2632	3.43	2105	2.74	527	0.69
Nov.	6.56	6.55	5.62	4.35	+0.04	+ 31	2730	3.55	2761	3.59	2091	2.72	670	0.87
Dec.	6.60	6.65	5.72	4.15	+0.26	+ 300	2652	3.45	2852	3.71	2153	2.80	699	0.91

a.—Niagara River discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
NOTE.—21, 24 and 27 indicate that St. Lawrence River discharges were derived from gage observations taken at Locks 21, 24 and 27, respectively.

TABLE 27.—Continued.
SUPPLY FACTORS OF LAKE ONTARIO.

DATE	WATER LEVELS OF—				STORAGE IN LAKE ONTARIO		OUTFLOW THROUGH ST. LAWRENCE RIVER		TOTAL SUPPLY TO LAKE ONTARIO		INFLOW FROM NIAGARA RIVER. <i>a</i>		LOCAL SUPPLY TO LAKE ONTARIO	
	LAKE ONTARIO		ST. LAWRENCE RIVER.											
	OSWEGO, N.Y.		Ogdens- burg, N.Y., Mean of Month.	Lock 27. Head of Galop Canal, Mean of Month.										
	First of Month.	Mean of Month.			Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Ontario.	100 c.f.s.	Feet Depth	100 c.f.s.	Feet Depth, Lake Ontario	100 c.f.s.	Foot Depth.
1865														
Jan.	246.86	247.08	246.12	244.56	+0.30	+ 230	2778	3.62	3008	3.92	2022	2.63	986	1.29
Feb.	7.16	7.23	6.26	4.70	+0.14	+ 108	2826	3.68	2934	3.82	1846	2.40	1088	1.42
Mar.	7.30	7.38	6.40	4.84	+0.12	+ 92	2873	3.74	2965	3.86	1904	2.48	1061	1.38
April	7.42	7.46	6.48	4.92	+0.12	+ 92	2900	3.77	2992	3.89	2050	2.67	942	1.22
May	7.54	7.62	6.63	5.36	+0.10	+ 77	3079	4.01	3156	4.11	2183	2.84	973	1.27
June	7.64	7.66	6.67	5.40	−0.06	− 46	3093	4.03	3047	3.97	2195	2.86	852	1.11
July	7.58	7.51	6.53	5.26	−0.38	− 292	3040	3.96	2748	3.58	2203	2.87	545	0.71
Aug.	7.20	6.90	5.95	4.68	−0.60	− 461	2842	3.70	2381	3.10	2165	2.82	216	0.28
Sept.	6.60	6.29	5.38	4.10	−0.42	− 323	2659	3.46	2336	3.04	2171	2.83	165	0.21
Oct.	6.18	6.07	5.17	3.90	−0.24	− 184	2584	3.36	2400	3.12	2112	2.75	288	0.37
Nov.	5.94	5.82	4.93	3.66	−0.20	− 154	2501	3.26	2347	3.06	2050	2.67	267	0.39
Dec.	5.74	5.66	4.78	3.21	−0.18	− 138	2350	3.06	2212	2.88	2061	2.68	151	0.20
1866														
Jan.	5.56	5.46	4.59	3.03	−0.10	− 77	2286	2.98	2209	2.88	1971	2.57	238	0.31
Feb.	5.46	5.47	4.60	3.04	+0.02	+ 15	2288	2.98	2303	3.00	1887	2.46	416	0.54
Mar.	5.48	5.48	4.61	3.04	+0.24	+ 184	2297	2.99	2481	3.23	1962	2.55	519	0.68
April	5.72	5.96	5.06	3.50	+0.27	+ 208	2432	3.17	2640	3.44	2077	2.70	563	0.74
May	5.99	6.02	5.12	3.85	−0.02	− 15	2565	3.34	2550	3.32	2125	2.77	425	0.55
June	5.97	5.92	5.03	3.75	+0.41	+ 315	2543	3.31	2858	3.72	2206	2.87	652	0.85
July	6.38	6.84	5.89	4.62	+0.41	+ 315	2822	3.67	3137	4.08	2248	2.93	889	1.15
Aug.	6.79	6.74	5.80	4.53	−0.09	− 69	2791	3.63	2722	3.54	2169	2.82	553	0.72
Sept.	6.70	6.65	5.72	4.44	−0.12	− 92	2772	3.61	2680	3.49	2169	2.83	511	0.66
Oct.	6.58	6.52	5.59	4.32	−0.18	− 138	2720	3.54	2582	3.36	2181	2.84	401	0.52
Nov.	6.40	6.28	5.37	4.09	−0.16	− 123	2655	3.46	2532	3.30	2150	2.80	382	0.50
Dec.	6.24	6.20	5.29	3.73	−0.16	− 123	2505	3.26	2382	3.10	2197	2.86	185	0.24
1867														
Jan.	6.08	5.95	5.06	3.49	−0.14	− 108	2438	3.17	2330	3.03	2098	2.73	232	0.30
Feb.	5.94	5.92	5.03	3.46	+0.33	+ 254	2428	3.16	2682	3.49	1975	2.57	707	0.92
Mar.	6.27	6.62	5.69	4.12	+0.80	+ 615	2642	3.44	3257	4.24	2055	2.67	1202	1.57
April	7.07	7.52	6.54	4.97	+0.79	+ 607	2929	3.81	3536	4.60	2112	2.75	1424	1.85
May	7.86	8.21	7.19	5.92	+0.48	+ 369	3278	4.27	3647	4.75	2234	2.91	1413	1.84
June	8.34	8.48	7.44	6.17	−0.04	− 31	3370	4.39	3339	4.35	2330	3.03	1009	1.32
July	8.30	8.11	7.09	5.82	−0.50	− 384	3243	4.22	2859	3.72	2298	2.99	561	0.73
Aug.	7.80	7.48	6.50	5.23	−0.57	− 438	3030	3.94	2592	3.37	2203	2.87	389	0.50
Sept.	7.23	6.98	6.03	4.76	−0.57	− 438	2866	3.73	2428	3.16	2123	2.76	305	0.40
Oct.	6.66	6.33	5.41	4.14	−0.70	− 538	2659	3.46	2121	2.76	2058	2.68	63	0.08
Nov.	5.96	5.59	4.72	3.44	−0.75	− 576	2445	3.18	1869	2.43	1970	2.56	−101	−0.13
Dec.	5.21	4.83	4.00	2.43	−0.54	− 415	2111	2.75	1696	2.21	1964	2.56	−268	−0.35
1868														
Jan.	4.67	4.51	3.70	2.93	−0.11	− 84	1699	2.21	1615	2.10	1891	2.46	−276	−0.36
Feb.	4.56	4.61	3.79	2.22	+0.18	+ 138	2049	2.67	2187	2.85	1765	2.30	422	0.55
Mar.	4.74	4.88	4.05	2.48	+0.46	+ 353	2126	2.77	2479	3.23	1878	2.44	601	0.79
April	5.20	5.52	4.65	3.08	+0.62	+ 476	2309	3.01	2785	3.63	2048	2.67	737	0.96
May	5.82	6.12	5.22	3.94	+0.51	+ 392	2605	3.39	2997	3.90	2149	2.80	848	1.10
June	6.33	6.54	5.61	4.34	+0.15	+ 115	2725	3.55	2840	3.70	2261	2.94	579	0.76
July	6.48	6.42	5.50	4.22	−0.20	− 154	2699	3.51	2545	3.31	2270	2.95	275	0.36
Aug.	6.28	6.13	5.23	3.95	−0.24	− 184	2609	3.40	2425	3.16	2125	2.77	300	0.39
Sept.	6.04	5.94	5.05	3.77	−0.40	− 307	2552	3.32	2245	2.92	2077	2.70	168	0.22
Oct.	5.64	5.35	4.49	3.21	−0.36	− 277	2370	3.08	2093	2.72	1987	2.59	106	0.13
Nov.	5.28	5.20	4.35	3.07	0.00	0	2326	3.03	2326	3.03	1976	2.57	350	0.46
Dec.	5.28	5.37	4.51	2.94	+0.02	+ 15	2266	2.95	2281	2.97	1973	2.57	308	0.40
1869														
Jan.	5.30	5.22	4.37	2.80	−0.02	− 15	2223	2.89	2208	2.87	1941	2.53	267	0.34
Feb.	5.28	5.34	4.48	2.91	+0.17	+ 131	2257	2.94	2388	3.11	1878	2.44	510	0.67
Mar.	5.45	5.56	4.69	3.12	+0.37	+ 284	2322	3.02	2606	3.39	1973	2.57	633	0.82
April	5.82	6.09	5.19	3.62	+0.60	+ 461	2480	3.23	2941	3.83	2025	2.64	916	1.19
May	6.42	6.75	5.81	4.54	+0.44	+ 338	2794	3.64	3132	4.08	2149	2.80	983	1.28
June	6.86	6.97	6.18	4.75	+0.27	+ 208	3076	4.00	3284	4.27	2261	2.94	1023	1.33
July	7.13	7.29	6.41	5.05	+0.19	+ 146	3091	4.02	3237	4.21	2348	3.06	889	1.15
Aug.	7.32	7.35	6.41	5.11	−0.06	− 46	3029	3.94	2983	3.88	2304	3.00	679	0.88
Sept.	7.27	7.17	6.16	4.94	−0.14	− 108	2862	3.72	2754	3.58	2251	2.93	503	0.65
Oct.	7.12	7.08	6.08	4.85	−0.24	− 184	2845	3.70	2661	3.46	2157	2.81	504	0.65
Nov.	6.88	6.68	5.70	4.47	−0.12	− 92	2717	3.54	2625	3.42	2075	2.70	550	0.72
Dec.	6.76	6.85	6.04	4.34	+0.30	+ 230	2852	3.71	3082	4.01	2203	2.87	879	1.14

a.—Niagara River discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
NOTE.—21, 24 and 27 indicate that St. Lawrence River discharges were derived from gage observations taken at Locks 21, 24 and 27, respectively.

SESSIONAL PAPER No. 54.

TABLE 27.—Continued.

SUPPLY FACTORS OF LAKE ONTARIO.

DATE	WATER LEVELS OF—				STORAGE IN LAKE ONTARIO		OUTFLOW THROUGH ST. LAWRENCE RIVER		TOTAL SUPPLY TO LAKE ONTARIO		INFLOW FROM NIAGARA RIVER. <i>a</i>		LOCAL SUPPLY TO LAKE ONTARIO	
	LAKE ONTARIO		ST. LAWRENCE RIVER.											
	OSWEGO, N.Y.		Ogdens- burg, N.Y., Mean of Month.	Lock 27, Head of Galop Canal, Mean of Month.										
	First of Month.	Mean of Month.			Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Ontario.	100 c.f.s.	Feet Depth	100 c.f.s.	Feet Depth, Lake Ontario	100 c.f.s.	Foot Depth.
1870														
Jan.	247.06	247.26	246.32	244.73	+0.28	+ 215	2748	3.58	2963	3.86	2229	2.90	734	0.99
Feb.	7.34	7.41	6.36	4.87	+0.07	+ 54	²¹ 2040	2.66	2094	2.73	2231	2.90	-137	-0.18
Mar.	7.41	7.41	6.16	4.87	+0.47	+ 361	²¹ 2760	3.59	3121	4.06	2164	2.82	957	1.25
April	7.88	8.35	7.35	5.76	+0.77	+ 592	3232	4.21	3824	4.98	2306	3.00	1518	1.98
May	8.65	8.95	7.87	6.62	+0.14	+ 108	3505	4.56	3613	4.70	2356	3.07	1257	1.63
June	8.79	8.63	7.60	6.32	-0.32	- 246	3441	4.48	3195	4.16	2368	3.08	827	1.08
July	8.47	8.31	7.36	6.01	-0.33	- 254	3432	4.47	3178	4.14	2395	3.12	783	1.02
Aug.	8.14	7.97	7.03	5.69	-0.52	- 400	3298	4.29	2898	3.77	2361	3.07	537	0.70
Sept.	7.62	7.28	6.19	5.04	-0.50	- 384	2795	3.64	2411	3.14	2314	3.01	97	0.13
Oct.	7.12	6.95	5.87	4.73	-0.46	- 353	2681	3.49	2328	3.03	2234	2.91	94	0.12
Nov.	6.66	6.38	5.64	4.19	-0.40	- 307	2898	3.77	2591	3.37	2188	2.85	403	0.52
Dec.	6.26	6.13	5.23	3.66	-0.16	- 123	2493	3.24	2370	3.08	2206	2.87	164	0.21
1871														
Jan.	6.10	6.06	5.16	3.59	-0.12	- 92	2471	3.22	2379	3.10	2123	2.76	256	0.34
Feb.	5.98	5.89	5.00	3.43	+0.02	+ 15	2419	3.15	2434	3.17	1997	2.60	437	0.57
Mar.	6.00	6.10	5.20	3.63	+0.40	+ 307	2483	3.23	2790	3.63	2088	2.72	702	0.91
April	6.40	6.70	5.76	4.20	+0.51	+ 392	2658	3.46	3050	3.97	2185	2.84	865	1.13
May	6.91	7.12	6.02	4.89	+0.18	+ 138	2722	3.54	2860	3.72	2248	2.93	612	0.80
June	7.09	7.06	6.28	4.83	-0.11	- 84	3131	4.08	3047	3.97	2273	2.96	774	1.01
July	6.98	6.90	6.01	4.68	-0.30	- 230	2921	3.80	2691	3.50	2285	2.97	406	0.53
Aug.	6.68	6.46	5.66	4.26	-0.39	- 300	2857	3.72	2557	3.33	2215	2.88	342	0.45
Sept.	6.29	6.12	5.34	3.94	-0.42	- 323	2749	3.58	2426	3.16	2188	2.85	238	0.31
Oct.	5.87	5.62	4.99	3.47	-0.45	- 346	2722	3.54	2376	3.09	2045	2.66	331	0.43
Nov.	5.42	5.21	4.39	3.08	-0.36	- 277	2361	3.07	2084	2.71	2029	2.64	55	0.07
Dec.	5.06	4.90	4.07	2.50	-0.24	- 184	2132	2.77	1948	2.53	1973	2.57	- 25	-0.04
1872														
Jan.	4.82	4.73	3.91	2.34	-0.20	- 154	²¹ 2062	2.68	1908	2.48	1925	2.51	- 17	-0.02
Feb.	4.62	4.51	3.70	2.13	-0.19	- 146	²¹ 1873	2.44	1727	2.25	1828	2.38	-101	-0.13
Mar.	4.43	4.35	3.55	1.98	+0.17	+ 131	²¹ 1945	2.53	2076	2.70	1798	2.34	278	0.36
April	4.60	4.84	4.01	2.44	+0.30	+ 230	2114	2.75	2344	3.05	1825	2.38	519	0.67
May	4.90	4.96	3.41	2.85	+0.22	+ 169	2448	3.19	2617	3.41	1917	2.50	700	0.91
June	5.12	5.29	4.53	3.16	+0.20	+ 154	2453	3.19	2607	3.39	2016	2.62	591	0.77
July	5.32	5.35	4.77	3.21	-0.05	- 38	2675	3.48	2637	3.43	2029	2.64	608	0.79
Aug.	5.27	5.19	4.66	3.06	-0.23	- 177	2665	3.47	2488	3.24	2005	2.61	483	0.63
Sept.	5.04	4.90	4.59	2.79	-0.22	- 169	2768	3.60	2599	3.38	1966	2.56	633	0.82
Oct.	4.82	4.74	4.09	2.64	-0.10	- 77	2366	3.08	2289	2.98	1941	2.53	348	0.45
Nov.	4.72	4.69	3.87	2.59	-0.20	- 154	2177	2.83	2023	2.63	1893	2.46	130	0.17
Dec.	4.52	4.35	3.55	1.98	-0.19	- 146	1978	2.57	1832	2.38	1885	2.45	- 53	-0.07
1873														
Jan.	4.33	4.31	3.51	1.94	+0.01	+ 8	1967	2.56	1975	2.57	1835	2.39	140	0.18
Feb.	4.34	4.38	3.58	2.00	+0.10	+ 77	1992	2.59	2069	2.69	1792	2.33	277	0.36
Mar.	4.44	4.50	3.69	2.12	+1.04	+ 799	2019	2.63	2818	3.67	1796	2.34	1022	1.33
April	5.48	6.46	5.54	3.97	+1.25	+ 960	2592	3.37	3552	4.62	2061	2.68	1491	1.94
May	6.73	7.00	6.15	4.77	+0.23	+ 177	3016	3.93	3193	4.16	2217	2.89	976	1.27
June	6.96	6.92	6.18	4.70	-0.06	- 46	3121	4.06	3075	4.00	2255	2.93	820	1.07
July	6.90	6.88	6.20	4.66	-0.16	- 123	3183	4.14	3060	3.98	2267	2.95	793	1.03
Aug.	6.74	6.60	5.67	4.40	-0.35	- 269	2746	3.57	2477	3.22	2231	2.90	246	0.32
Sept.	6.39	6.18	5.27	4.00	-0.43	- 330	2613	3.40	2283	2.97	2150	2.80	133	0.17
Oct.	5.96	5.73	4.85	3.57	-0.30	- 230	2486	3.24	2256	2.94	2094	2.73	162	0.21
Nov.	5.66	5.60	4.73	3.45	+0.04	+ 31	2447	3.18	2478	3.22	2072	2.70	406	0.52
Dec.	5.70	5.79	4.90	3.34	+0.37	+ 284	2381	3.10	2665	3.47	2206	2.87	459	0.60
1874														
Jan.	6.07	6.35	5.43	3.87	+0.48	+ 369	2551	3.32	2920	3.80	2269	2.95	651	0.85
Feb.	6.55	6.75	5.81	4.24	+0.47	+ 361	²¹ 2632	3.43	2993	3.90	2227	2.90	766	1.00
Mar.	7.02	7.30	6.33	4.77	+0.22	+ 169	2849	3.71	3018	3.93	2221	2.89	797	1.04
April	7.24	7.19	6.22	4.66	-0.06	- 46	2812	3.66	2766	3.60	2246	2.92	520	0.68
May	7.18	7.17	6.21	4.94	+0.04	+ 31	2933	3.82	2964	3.86	2267	2.95	697	0.91
June	7.22	7.26	6.29	5.02	+0.02	+ 15	2960	3.85	2975	3.87	2301	2.99	674	0.88
July	7.24	7.21	6.24	4.97	-0.14	- 108	2945	3.83	2837	3.69	2327	3.03	510	0.66
Aug.	7.10	6.98	6.16	4.76	-0.44	- 338	3039	3.96	2701	3.52	2267	2.95	434	0.57
Sept.	6.66	6.34	5.42	4.15	-0.52	- 400	2662	3.46	2262	2.94	2170	2.82	92	0.12
Oct.	6.14	5.94	5.05	3.77	-0.48	- 369	2551	3.32	2182	2.84	2079	2.71	103	0.13
Nov.	5.66	5.37	4.51	3.23	-0.46	- 353	2377	3.09	2024	2.63	2009	2.61	15	0.02
Dec.	5.20	5.03	4.19	2.62	-0.32	- 246	2168	2.82	1922	2.50	2005	2.61	- 83	-0.11

a.—Niagara River discharge values indicate a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
NOTE.—21, 24 and 27 indicate that St. Lawrence River discharge were derived from gage observations taken at Locks 21, 24 and 27, respectively.

TABLE 27.—Continued.
SUPPLY FACTORS OF LAKE ONTARIO.

DATE	WATER LEVELS OF—				STORAGE IN LAKE ONTARIO		OUTFLOW THROUGH ST. LAWRENCE RIVER		TOTAL SUPPLY TO LAKE ONTARIO		INFLOW FROM NIAGARA RIVER. <i>a</i>		LOCAL SUPPLY TO LAKE ONTARIO	
	LAKE ONTARIO		ST. LAWRENCE RIVER.											
	OSWEGO, N.Y.		Ogdens- burg, N.Y., Mean of Month.	Lock 27, Head of Galop Canal, Mean of Month.										
	First of Month.	Mean of Month.			Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Ontario.	100 c.f.s.	Feet Depth	100 c.f.s.	Feet Depth, Lake Ontario	100 c.f.s.	Foot Depth.
1875														
Jan.	244.88	244.73	243.91	241.45	−0.32	− 246	²⁷ 1843	2.40	1597	2.08	1923	2.50	−326	−0.42
Feb.	4.56	4.38	3.58	0.46	−0.05	− 38	²⁷ 1579	2.06	1541	2.01	1840	2.39	−299	−0.39
Mar.	4.51	4.64	3.82	1.77	+0.53	+ 407	²⁷ 1931	2.51	2338	3.04	1860	2.42	478	0.62
April	5.04	5.44	4.57	3.24	+0.54	+ 415	2435	3.17	2850	3.71	1929	2.51	921	1.20
May	5.58	5.71	4.83	3.61	+0.21	+ 161	2428	3.16	2589	3.37	2033	2.65	556	0.72
June	5.79	5.87	4.98	3.80	+0.09	+ 69	2440	3.18	2509	3.27	2149	2.80	360	0.47
July	5.88	5.90	5.01	3.79	−0.05	− 38	2484	3.23	2446	3.18	2197	2.86	249	0.32
Aug.	5.83	5.76	4.88	3.62	−0.17	− 131	2478	3.23	2347	3.06	2176	2.83	171	0.23
Sept.	5.66	5.55	4.68	3.53	−0.25	− 192	2320	3.02	2128	2.77	2157	2.81	− 29	−0.04
Oct.	5.41	5.27	4.41	3.15	−0.23	− 177	2329	3.03	2152	2.80	2056	2.68	96	0.12
Nov.	5.18	5.08	4.24	2.81	−0.19	− 146	2402	3.13	2256	2.94	2047	2.66	209	0.28
Dec.	4.99	4.90	4.07	2.77	+0.11	+ 84	2253	2.93	2337	3.04	2143	2.79	194	0.25
1876														
Jan.	5.10	5.31	4.45	2.91	+0.54	+ 415	2229	2.90	2644	3.44	2102	2.74	542	0.70
Feb.	5.64	5.97	5.07	3.73	+0.60	+ 461	²¹ 2478	3.23	2939	3.83	2183	2.84	756	0.98
Mar.	6.24	6.52	5.59	4.02	+0.77	+ 592	²¹ 2583	3.36	3175	4.13	2332	3.04	843	1.10
April	7.01	7.50	6.52	5.35	+0.78	+ 599	2931	3.81	3530	4.59	2446	3.18	1084	1.41
May	7.79	8.08	7.06	5.95	+0.40	+ 307	3041	3.96	3348	4.36	2528	3.29	820	1.07
June	8.19	8.30	7.27	6.23	+0.15	+ 115	3023	3.93	3138	4.08	2578	3.36	560	0.72
July	8.34	8.37	7.34	6.25	−0.20	− 154	3112	4.05	2958	3.85	2567	3.34	391	0.51
Aug.	8.14	7.91	6.90	5.64	−0.54	− 415	3164	4.12	2749	3.58	2465	3.21	284	0.37
Sept.	7.60	7.30	6.33	4.99	−0.47	− 361	3042	3.96	2681	3.49	2435	3.17	246	0.32
Oct.	7.13	6.96	6.01	4.92	−0.35	− 269	2672	3.48	2403	3.13	2317	3.02	86	0.11
Nov.	6.78	6.60	5.67	4.20	−0.27	− 208	2926	3.81	2718	3.54	2365	3.08	353	0.46
Dec.	6.51	6.42	5.50	3.67	−0.35	− 269	2748	3.58	2479	3.23	2327	3.03	152	0.20
1877														
Jan.	6.16	5.89	5.00	2.37	−0.40	− 307	²⁷ 2100	2.73	1793	2.33	2196	2.86	−403	−0.52
Feb.	5.76	5.62	4.74	3.17	−0.06	− 46	2337	3.04	2291	2.98	2105	2.74	186	0.24
Mar.	5.70	5.77	4.89	3.57	+0.42	+ 323	²⁷ 2452	3.19	2775	3.61	2041	2.66	724	0.96
April	6.12	6.46	5.54	3.80	+0.38	+ 292	2706	3.52	2998	3.90	2124	2.76	874	1.14
May	6.50	6.53	5.60	4.51	−0.02	− 15	2546	3.31	2531	3.29	2181	2.84	350	0.45
June	6.48	6.43	5.51	4.38	−0.03	− 23	2560	3.33	2537	3.30	2217	2.89	320	0.41
July	6.45	6.47	5.55	4.56	−0.11	− 84	2424	3.15	2340	3.04	2294	2.99	46	0.05
Aug.	6.34	6.20	5.29	4.05	−0.36	− 277	2594	3.38	2317	3.02	2239	2.91	78	0.11
Sept.	5.98	5.77	4.89	3.51	−0.42	− 323	2580	3.36	2257	2.94	2234	2.91	23	0.03
Oct.	5.56	5.34	4.48	2.90	−0.26	− 200	2586	3.37	2386	3.11	2152	2.80	234	0.31
Nov.	5.30	5.25	4.40	3.00	+0.02	+ 15	2433	3.17	2448	3.19	2159	2.81	289	0.38
Dec.	5.32	5.38	4.52	2.99	+0.11	+ 84	2245	2.92	2329	3.03	2225	2.90	104	0.13
1878														
Jan.	5.43	5.48	4.61	2.97	+0.15	+ 115	²⁷ 2273	2.96	2388	3.11	2213	2.88	175	0.23
Feb.	5.58	5.69	4.81	3.20	+0.46	+ 353	²⁷ 2342	3.05	2695	3.51	2195	2.86	500	0.65
Mar.	6.04	6.39	5.47	4.01	+0.48	+ 369	2493	3.24	2862	3.72	2213	2.88	649	0.84
April	6.52	6.64	5.71	4.63	+0.29	+ 223	2570	3.34	2793	3.63	2298	2.99	495	0.64
May	6.81	6.98	6.03	5.20	+0.17	+ 131	2370	3.08	2501	3.25	2356	3.07	145	0.18
June	6.98	6.97	6.02	4.74	−0.03	− 23	2875	3.74	2852	3.71	2375	3.09	477	0.62
July	6.95	6.93	5.98	4.63	−0.06	− 46	2930	3.81	2884	3.75	2393	3.11	491	0.64
Aug.	6.89	6.85	5.90	4.53	−0.17	− 131	2920	3.80	2789	3.63	2317	3.02	472	0.61
Sept.	6.72	6.59	5.66	4.31	−0.26	− 200	2816	3.66	2616	3.40	2298	2.99	318	0.41
Oct.	6.46	6.33	5.41	3.99	−0.19	− 146	2792	3.63	2646	3.44	2227	2.90	419	0.54
Nov.	6.27	6.21	5.30	3.84	+0.35	+ 269	2786	3.63	3055	3.98	2206	2.87	849	1.11
Dec.	6.62	7.02	6.06	4.95	+0.30	+ 230	2711	3.53	2941	3.83	2271	2.96	670	0.87
1879														
Jan.	6.92	6.81	5.87	3.39	−0.29	− 223	²⁷ 2398	3.12	2175	2.83	2137	2.78	38	0.05
Feb.	6.63	6.45	5.53	3.75	−0.25	− 192	²¹ 2378	3.10	2186	2.85	2055	2.67	131	0.17
Mar.	6.38	6.30	5.39	3.81	+0.12	+ 92	²¹ 2381	3.10	2473	3.22	2051	2.67	422	0.55
April	6.50	6.71	5.77	4.36	+0.26	+ 200	2550	3.32	2750	3.58	2118	2.76	632	0.82
May	6.76	6.80	5.86	4.44	+0.06	+ 46	2950	3.84	2996	3.90	2149	2.80	847	1.10
June	6.82	6.83	5.88	4.54	−0.07	− 54	2882	3.75	2828	3.68	2187	2.85	641	0.83
July	6.75	6.67	5.73	4.50	−0.25	− 192	2727	3.55	2535	3.30	2213	2.88	322	0.42
Aug.	6.50	6.32	5.40	3.86	−0.39	− 300	2884	3.75	2584	3.36	2140	2.79	444	0.57
Sept.	6.11	5.90	5.01	3.45	−0.43	− 330	2759	3.59	2429	3.16	2077	2.70	352	0.46
Oct.	5.68	5.46	4.59	2.86	−0.42	− 323	2724	3.55	2401	3.13	2038	2.65	363	0.48
Nov.	5.26	5.07	4.23	2.94	−0.18	− 138	2297	2.99	2159	2.81	1956	2.55	203	0.26
Dec.	5.08	5.10	4.25	2.90	+0.13	+ 100	2346	3.05	2446	3.18	2059	2.68	387	0.50

a.—Niagara River discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
NOTE.—21, 24 and 27 indicate that St. Lawrence River discharges were derived from gage observations taken at Locks 21, 24, and 27, respectively.

SESSIONAL PAPER No. 54.

TABLE 27.—Continued.
SUPPLY FACTORS OF LAKE ONTARIO.

DATE	WATER LEVELS OF—				STORAGE IN LAKE ONTARIO		OUTFLOW THROUGH ST. LAWRENCE RIVER		TOTAL SUPPLY TO LAKE ONTARIO		INFLOW FROM NIAGARA RIVER. <i>a</i>		LOCAL SUPPLY TO LAKE ONTARIO	
	LAKE ONTARIO		ST. LAWRENCE RIVER.											
	OSWEGO, N.Y.		Ogdens- burg, N.Y., Mean of Month.	Lock 27. Head of Galop Canal, Mean of Month.										
	First of Month.	Mean of Month.			Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Ontario.	100 c.f.s.	Feet Depth	100 c.f.s.	Feet Depth, Lake Ontario	100 c.f.s.	Foot Depth.
1880														
Jan.	245.21	245.32	244.46	243.03	+0.25	+ 192	2165	2.82	2357	3.07	2146	2.79	211	0.28
Feb.	5.46	5.60	4.73	3.48	+0.31	+ 238	2424	3.15	2662	3.46	2103	2.74	559	0.73
Mar.	5.77	5.94	5.05	3.60	+0.26	+ 200	2355	3.07	2555	3.33	2124	2.76	431	0.57
April	6.03	6.12	5.22	4.04	+0.17	+ 131	2513	3.27	2644	3.44	2145	2.79	499	0.65
May	6.20	6.27	5.36	4.14	+0.19	+ 146	2599	3.38	2745	3.57	2207	2.87	538	0.70
June	6.39	6.51	5.58	4.33	+0.13	+ 100	2696	3.51	2796	3.64	2251	2.93	545	0.71
July	6.52	6.52	5.59	4.33	-0.22	- 169	2710	3.53	2541	3.31	2291	2.98	250	0.33
Aug.	6.30	6.09	5.19	3.91	-0.40	- 307	2597	3.38	2290	2.98	2213	2.88	77	0.10
Sept.	5.90	5.72	4.84	3.60	-0.38	- 292	2449	3.19	2157	2.81	2172	2.83	- 15	-0.02
Oct.	5.52	5.31	4.45	3.27	-0.23	- 177	2276	2.96	2099	2.73	2081	2.71	18	0.02
Nov.	5.29	5.27	4.41	3.29	-0.11	- 84	2212	2.88	2128	2.77	2088	2.72	40	0.05
Dec.	5.18	5.10	4.25	2.74	-0.26	- 200	2152	2.80	1952	2.54	2055	2.67	-103	-0.13
1881														
Jan.	4.92	4.74	3.91	1.02	-0.18	- 138	²⁷ 1726	2.25	1588	2.07	1931	2.51	-343	-0.45
Feb.	4.74	4.73	3.91	1.56	+0.32	+ 246	²¹ 1723	2.24	1969	2.56	1908	2.48	61	0.08
Mar.	5.06	5.39	4.53	2.83	+0.54	+ 415	²¹ 2230	2.90	2645	3.44	1968	2.56	677	0.88
April	5.60	5.81	4.92	3.53	+0.30	+ 230	2598	3.38	2828	3.68	2112	2.75	716	0.93
May	5.90	5.99	5.09	3.72	+0.20	+ 154	2641	3.44	2795	3.64	2205	2.87	590	0.77
June	6.10	6.21	5.30	3.93	+0.14	+ 108	2710	3.53	2818	3.67	2281	2.97	527	0.70
July	6.24	6.28	5.37	4.04	-0.12	- 92	2699	3.51	2607	3.39	2286	2.98	321	0.41
Aug.	6.12	5.96	5.06	3.72	-0.44	- 338	2605	3.39	2267	2.95	2188	2.85	79	0.10
Sept.	5.68	5.40	4.54	3.39	-0.39	- 300	2278	2.96	1978	2.57	2119	2.76	-141	-0.19
Oct.	5.29	5.18	4.33	3.02	-0.11	- 84	2343	3.05	2259	2.94	2121	2.76	138	0.18
Nov.	5.18	5.18	4.33	3.06	0.00	0	2313	3.01	2313	3.01	2105	2.74	208	0.27
Dec.	5.18	5.18	4.33	3.10	+0.28	+ 215	2281	2.97	2496	3.25	2200	2.86	296	0.39
1882														
Jan.	5.46	5.73	4.85	3.20	+0.36	+ 277	²⁷ 2342	3.05	2619	3.41	2283	2.97	336	0.44
Feb.	5.82	5.90	5.01	3.44	+0.38	+ 292	²¹ 2387	3.11	2679	3.49	2229	2.90	450	0.59
Mar.	6.20	6.50	5.57	4.07	+0.46	+ 353	2553	3.32	2906	3.78	2330	3.03	576	0.75
April	6.66	6.83	5.88	4.84	+0.26	+ 200	2579	3.36	2779	3.62	2367	3.08	412	0.54
May	6.92	7.02	6.06	4.69	+0.36	+ 277	2975	3.87	3252	4.23	2416	3.14	836	1.09
June	7.28	7.53	6.54	5.40	+0.24	+ 184	2901	3.78	3085	4.02	2474	3.22	611	0.80
July	7.52	7.52	6.54	5.34	-0.16	- 123	2970	3.87	2847	3.71	2474	3.22	373	0.49
Aug.	7.36	7.19	6.22	4.95	-0.36	- 277	2937	3.82	2660	3.46	2416	3.14	244	0.32
Sept.	7.00	6.81	5.87	4.46	-0.44	- 338	2946	3.83	2608	3.39	2362	3.07	246	0.32
Oct.	6.56	6.30	5.39	4.10	-0.47	- 361	2670	3.47	2309	3.00	2265	2.95	44	0.05
Nov.	6.09	5.88	4.99	3.67	-0.35	- 269	2566	3.34	2297	2.99	2213	2.88	84	0.11
Dec.	5.74	5.59	4.72	3.51	-0.28	- 215	2385	3.10	2170	2.82	2135	2.78	35	0.04
1883														
Jan.	5.46	5.32	4.46	1.87	-0.11	- 84	²⁷ 1959	2.55	1875	2.44	2084	2.71	-209	-0.27
Feb.	5.35	5.38	4.52	2.01	+0.15	+ 115	²⁴ 1872	2.44	1987	2.59	2081	2.71	- 94	-0.12
Mar.	5.50	5.62	4.74	2.76	+0.38	+ 292	²⁴ 2213	2.88	2505	3.26	2115	2.75	390	0.51
April	5.88	6.14	5.23	3.78	+0.58	+ 446	2411	3.14	2857	3.72	2126	2.77	731	0.95
May	6.46	6.79	5.85	4.56	+0.68	+ 522	2827	3.68	3349	4.36	2234	2.91	1115	1.45
June	7.14	7.49	6.51	5.37	+0.62	+ 476	2892	3.76	3368	4.38	2427	3.16	941	1.22
July	7.76	8.02	7.01	5.77	+0.17	+ 131	3180	4.14	3311	4.31	2500	3.25	811	1.06
Aug.	7.93	7.84	6.84	5.58	-0.33	- 254	3141	4.09	2887	3.76	2462	3.20	425	0.56
Sept.	7.60	7.36	6.38	5.10	-0.46	- 353	3001	3.91	2648	3.45	2397	3.12	251	0.33
Oct.	7.14	6.92	5.97	4.66	-0.34	- 261	2886	3.76	2625	3.42	2332	3.04	293	0.38
Nov.	6.80	6.69	5.75	4.59	-0.18	- 138	2664	3.47	2526	3.29	2265	2.95	261	0.34
Dec.	6.62	6.55	5.62	4.42	-0.09	- 69	2662	3.46	2593	3.37	2320	3.02	273	0.35
1884														
Jan.	6.53	6.51	5.58	3.29	+0.17	+ 131	²⁴ 2184	2.84	2315	3.01	2206	2.87	109	0.14
Feb.	6.70	6.88	5.93	3.76	+0.52	+ 400	²⁴ 2324	3.02	2724	3.55	2215	2.88	509	0.66
Mar.	7.22	7.56	6.57	4.46	+0.64	+ 492	²⁷ 2724	3.55	3216	4.19	2248	2.93	968	1.26
April	7.86	8.17	7.15	5.71	+0.32	+ 246	3029	3.94	3275	4.26	2370	3.08	905	1.18
May	8.18	8.19	7.17	5.92	-0.04	- 31	3248	4.23	3217	4.19	2436	3.17	781	1.02
June	8.14	8.09	7.07	5.81	-0.16	- 123	3224	4.20	3101	4.04	2475	3.22	626	0.81
July	7.98	7.88	6.87	5.61	-0.22	- 169	3153	4.10	2984	3.88	2436	3.17	548	0.71
Aug.	7.76	7.65	6.66	5.52	-0.32	- 246	2944	3.83	2698	3.51	2375	3.09	323	0.42
Sept.	7.44	7.22	6.39	5.15	-0.43	- 330	2963	3.86	2633	3.43	2281	2.97	352	0.46
Oct.	7.01	6.80	5.97	4.67	-0.46	- 353	2876	3.74	2523	3.28	2215	2.88	308	0.40
Nov.	6.55	6.30	5.55	4.33	-0.33	- 254	2657	3.46	2403	3.13	2126	2.77	277	0.36
Dec.	6.22	6.15	5.24	4.13	-0.08	- 62	2454	3.19	2392	3.11	2155	2.80	237	0.31

a.—Niagara River discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
NOTE.—21, 24 and 27 indicate that St. Lawrence River discharges were derived from gage observations taken at Locks 21, 24 and 27 respectively.

TABLE 27.—Continued.

SUPPLY FACTORS OF LAKE ONTARIO.

DATE	WATER LEVELS OF—				STORAGE IN LAKE ONTARIO		OUTFLOW THROUGH ST. LAWRENCE RIVER		TOTAL SUPPLY TO LAKE ONTARIO		INFLOW FROM NIAGARA RIVER. <i>a</i>		LOCAL SUPPLY TO LAKE ONTARIO	
	LAKE ONTARIO		ST. LAWRENCE RIVER.											
	OSWEGO, N. Y.		Ogdens- burg, N. Y., Mean of Month.	Lock 27, Head of Galop Canal, Mean of Month.										
	First of Month.	Mean of Month.			Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Ontario.	100 c.f.s.	Feet Depth	100 c.f.s.	Feet Depth, Lake ntario	100 c.f.s.	Foot Depth.
1885														
Jan.	246.14	246.14	245.23	243.73	−0.14	−108	²⁴ 2270	2.95	2162	2.81	2081	2.71	81	0.11
Feb.	6.00	5.87	4.98	2.52	−0.27	−208	²⁴ 2121	2.76	1913	2.49	1984	2.58	− 71	−0.09
Mar.	5.73	5.59	4.72	2.73	+0.20	+154	²⁴ 2197	2.86	2351	3.06	1941	2.53	410	0.53
April	5.93	6.27	5.36	3.69	+0.74	+569	2600	3.38	3169	4.12	2112	2.75	1057	1.37
May	6.67	7.07	6.11	4.96	+0.59	+453	2771	3.61	3224	4.20	2286	2.98	938	1.22
June	7.26	7.44	6.47	5.35	+0.25	+192	2855	3.72	3047	3.97	2434	3.17	613	0.80
July	7.51	7.58	6.59	5.45	−0.01	− 8	2920	3.80	2912	3.79	2441	3.18	471	0.61
Aug.	7.50	7.43	6.45	5.30	−0.18	−138	2884	3.75	2746	3.57	2423	3.15	323	0.42
Sept.	7.32	7.21	6.24	5.11	−0.20	−154	2792	3.63	2638	3.43	2400	3.12	238	0.31
Oct.	7.12	7.02	6.05	4.87	−0.08	− 62	2784	3.62	2722	3.54	2390	3.11	332	0.43
Nov.	7.04	7.07	6.11	4.86	+0.12	+ 92	2877	3.74	2969	3.86	2387	3.11	582	0.75
Dec.	7.16	7.24	6.27	5.07	+0.26	+200	2879	3.75	3079	4.01	2423	3.15	656	0.86
1886														
Jan.	7.42	7.60	6.61	5.15	+0.22	+169	²⁴ 2787	3.63	2956	3.85	2395	3.12	561	0.73
Feb.	7.64	7.67	6.68	5.06	+0.10	+ 77	²¹ 2397	3.12	2474	3.22	2159	2.81	315	0.41
Mar.	7.74	7.81	6.81	5.02	+0.38	+292	²¹ 2693	3.51	2985	3.88	2103	2.74	882	1.15
April	8.12	8.43	7.39	5.90	+0.42	+323	3159	4.11	3482	4.53	2298	2.99	1184	1.54
May	8.54	8.64	7.59	6.49	0.00	0	3208	4.18	3208	4.18	2372	3.09	836	1.09
June	8.54	8.44	7.40	6.28	−0.30	−230	3172	4.13	2942	3.83	2416	3.14	526	0.69
July	8.24	8.04	7.03	5.83	−0.42	−323	3140	4.09	2817	3.67	2428	3.16	389	0.51
Aug.	7.82	7.60	6.61	5.47	−0.40	−307	2928	3.81	2621	3.41	2357	3.07	264	0.34
Sept.	7.42	7.24	6.27	5.16	−0.32	−246	2780	3.62	2534	3.30	2307	3.00	227	0.30
Oct.	7.10	6.95	6.00	4.76	−0.37	−284	2829	3.68	2545	3.31	2267	2.95	278	0.36
Nov.	6.73	6.51	5.58	4.62	−0.27	−208	2399	3.12	2191	2.85	2222	2.89	− 31	−0.04
Dec.	6.46	6.42	5.50	4.31	−0.16	−123	2614	3.40	2491	3.24	2246	2.92	245	0.32
1887														
Jan.	6.30	6.17	5.26	3.97	+0.24	+184	²¹ 2460	3.20	2644	3.44	2161	2.81	483	0.63
Feb.	6.54	6.92	5.97	4.22	+0.64	+492	²⁷ 2650	3.45	3142	4.09	2212	2.88	930	1.21
Mar.	7.18	7.43	6.45	4.69	+0.36	+277	²⁷ 2796	3.64	3073	4.00	2383	3.10	690	0.90
April	7.54	7.64	6.65	5.39	+0.38	+292	3075	4.00	3367	4.38	2372	3.09	995	1.29
May	7.92	8.20	7.14	5.91	+0.26	+200	3212	4.18	3412	4.44	2427	3.16	985	1.28
June	8.18	8.16	7.08	5.95	−0.16	−123	3074	4.00	2951	3.84	2465	3.21	486	0.63
July	8.02	7.88	6.90	5.67	−0.40	−307	3128	4.07	2821	3.67	2423	3.15	398	0.52
Aug.	7.62	7.37	6.39	5.17	−0.56	−430	2942	3.83	2512	3.27	2322	3.02	190	0.25
Sept.	7.06	6.76	5.82	4.72	−0.50	−384	2624	3.42	2240	2.92	2244	2.92	− 4	0.00
Oct.	6.56	6.37	5.45	4.40	−0.36	−277	2458	3.20	2181	2.84	2258	2.94	− 77	−0.10
Nov.	6.20	6.02	5.12	3.90	−0.32	−246	2519	3.28	2273	2.96	2125	2.77	148	0.19
Dec.	5.88	5.75	4.87	3.64	−0.28	−215	2449	3.19	2234	2.91	2170	2.82	64	0.09
1888														
Jan.	5.60	5.44	4.57	3.49	−0.23	−177	2225	2.90	2048	2.67	2094	2.73	− 46	−0.06
Feb.	5.37	5.30	4.44	2.27	+0.05	+ 38	²⁴ 1996	2.60	2034	2.65	1954	2.54	80	0.10
Mar.	5.42	5.54	4.67	2.27	+0.44	+338	²⁷ 2072	2.70	2410	3.14	1971	2.57	439	0.57
April	5.86	6.17	5.26	4.05	+0.34	+261	2555	3.33	2816	3.67	2121	2.76	695	0.91
May	6.20	6.24	5.33	4.20	+0.06	+ 46	2500	3.25	2546	3.31	2157	2.81	389	0.50
June	6.26	6.28	5.37	4.23	+0.05	+ 38	2523	3.28	2561	3.33	2197	2.86	364	0.47
July	6.31	6.34	5.42	4.22	−0.02	− 15	2599	3.38	2584	3.36	2251	2.93	333	0.43
Aug.	6.29	6.24	5.33	4.08	−0.25	−192	2615	3.40	2423	3.15	2225	2.90	198	0.25
Sept.	6.04	5.85	4.96	3.91	−0.37	−284	2311	3.01	2027	2.64	2142	2.79	−115	−0.15
Oct.	5.67	5.49	4.62	3.26	−0.21	−161	2475	3.22	2314	3.01	2098	2.73	216	0.28
Nov.	5.46	5.42	4.56	3.17	−0.04	− 31	2478	3.23	2447	3.19	2064	2.69	383	0.50
Dec.	5.42	5.41	4.55	3.30	+0.10	+ 77	2366	3.08	2443	3.18	2133	2.78	310	0.40
1889														
Jan.	5.52	5.62	4.74	3.51	+0.17	+131	2408	3.13	2539	3.30	2091	2.72	448	0.58
Feb.	5.69	5.76	4.88	2.87	+0.15	+115	²¹ 2207	2.87	2322	3.02	2041	2.66	281	0.37
Mar.	5.84	5.93	5.04	3.43	+0.21	+161	²⁴ 2283	2.97	2444	3.18	1952	2.54	492	0.64
April	6.05	6.17	5.26	4.01	+0.19	+146	2594	3.38	2740	3.57	2038	2.65	702	0.92
May	6.24	6.32	5.40	4.19	+0.24	+184	2601	3.39	2785	3.63	2075	2.70	710	0.93
June	6.48	6.63	5.70	4.51	+0.24	+184	2678	3.49	2862	3.73	2186	2.85	676	0.88
July	6.72	6.82	5.88	4.61	−0.02	− 15	2819	3.67	2804	3.65	2196	2.86	608	0.79
Aug.	6.70	6.57	5.64	4.35	−0.41	−315	2754	3.58	2439	3.17	2174	2.83	265	0.34
Sept.	6.29	6.01	5.11	3.83	−0.50	−384	2571	3.35	2187	2.85	2084	2.71	103	0.14
Oct.	5.79	5.57	4.70	3.12	−0.42	−323	2666	3.47	2343	3.05	1970	2.56	373	0.49
Nov.	5.37	5.17	4.32	3.15	+0.09	+ 69	2228	2.90	2297	2.99	1970	2.56	327	0.43
Dec.	5.46	5.74	4.86	3.46	+0.54	+415	2264	2.95	2679	3.49	2041	2.66	638	0.83

a. —Niagara River discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
NOTE.—21, 24 and 27 indicate that St. Lawrence River discharges were derived from gage observations taken at Locks 21, 24 and 27, respectively.

SESSIONAL PAPER No. 54.

TABLE 27.—Continued.

SUPPLY FACTORS OF LAKE ONTARIO.

DATE	WATER LEVELS OF—				STORAGE IN LAKE ONTARIO		OUTFLOW THROUGH ST. LAWRENCE RIVER		TOTAL SUPPLY TO LAKE ONTARIO		INFLOW FROM NIAGARA RIVER. <i>a</i>		LOCAL SUPPLY TO LAKE ONTARIO	
	LAKE ONTARIO		ST. LAWRENCE RIVER.											
	OSWEGO, N.Y.		Ogdens- burg, N.Y., Mean of Month.	Lock 27, Head of Galop Canal, Mean of Month.										
	First of Month.	Mean of Month.			Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Ontario.	100 c.f.s.	Feet Depth.	100 c.f.s.	Feet Depth, Lake Ontario.	100 c.f.s.	Foot Depth.
1890														
Jan.	246.00	246.25	245.34	244.10	+0.42	+323	²⁴ 2589	3.37	2912	3.79	2178	2.83	734	0.96
Feb.	6.42	6.60	5.67	4.13	+0.34	+261	2614	3.40	2875	3.74	2133	2.78	742	0.96
Mar.	6.76	6.93	5.98	4.64	+0.29	+223	²⁴ 2748	3.58	2971	3.87	2191	2.85	780	1.02
April	7.05	7.17	6.21	4.98	+0.30	+230	2890	3.76	3120	4.06	2251	2.93	869	1.13
May	7.35	7.53	6.59	5.26	+0.49	+376	3128	4.07	3504	4.56	2342	3.05	1162	1.51
June	7.84	8.16	7.00	5.89	+0.24	+184	3020	3.93	3204	4.17	2426	3.16	778	1.01
July	8.08	7.99	6.97	5.74	-0.42	-323	3155	4.11	2832	3.69	2354	3.06	748	0.62
Aug.	7.66	7.32	6.12	5.09	-0.52	-400	2643	3.44	2243	2.92	2237	2.91	6	0.01
Sept.	7.14	6.97	6.02	4.75	-0.34	-261	2866	3.73	2605	3.39	2152	2.80	453	0.59
Oct.	6.80	6.64	5.71	4.38	-0.12	- 92	2816	3.66	2724	3.54	2150	2.80	574	0.74
Nov.	6.68	6.72	5.78	4.32	-0.06	- 46	2956	3.85	2910	3.79	2196	2.86	714	0.93
Dec.	6.62	6.51	5.58	3.44	-0.27	-208	2591	3.37	2383	3.10	2133	2.78	250	0.32
1891														
Jan.	6.35	6.19	5.28	3.41	-0.03	- 23	²⁷ 2404	3.13	2381	3.10	2072	2.70	309	0.40
Feb.	6.32	6.45	5.53	3.48	+0.40	+307	²⁷ 2425	3.16	2732	3.56	2046	2.66	686	0.89
Mar.	6.72	6.99	6.04	4.30	+0.51	+392	²⁴ 2649	3.45	3041	3.96	2077	2.70	964	1.25
April	7.23	7.47	6.49	5.13	+0.13	+100	3122	4.06	3222	4.19	2106	2.74	1116	1.45
May	7.36	7.25	6.28	4.93	-0.32	-246	3033	3.95	2787	3.63	2054	2.67	733	0.96
June	7.04	6.83	5.72	4.52	-0.35	-269	2693	3.51	2424	3.16	2050	2.67	374	0.49
July	6.69	6.55	5.49	4.38	-0.36	-277	2530	3.29	2253	2.93	2091	2.72	162	0.21
Aug.	6.33	6.11	5.07	3.99	-0.43	-330	2374	3.09	2044	2.66	2025	2.64	19	0.02
Sept.	5.90	5.68	4.71	3.50	-0.54	-415	2382	3.10	1967	2.56	1986	2.58	- 19	-0.02
Oct.	5.36	5.04	4.29	2.83	-0.62	-476	2440	3.18	1964	2.56	1903	2.48	61	0.08
Nov.	4.74	4.44	3.99	2.59	-0.32	-246	2299	2.99	2053	2.67	1891	2.46	162	0.21
Dec.	4.42	4.41	3.60	2.42	+0.04	+ 31	2023	2.63	2054	2.67	1897	2.47	157	0.20
1892														
Jan.	4.46	4.51	3.70	2.33	+0.04	+ 31	²⁴ 2089	2.72	2120	2.76	1878	2.44	242	0.31
Feb.	4.50	4.48	3.67	1.83	+0.04	+ 31	²¹ 1851	2.41	1882	2.45	1733	2.26	149	0.19
Mar.	4.54	4.61	3.79	1.98	+0.36	+277	²¹ 1974	2.57	2251	2.93	1775	2.31	476	0.62
April	4.90	5.19	4.34	2.97	+0.32	+246	2392	3.11	2638	3.43	1954	2.54	684	0.89
May	5.22	5.25	4.40	3.16	+0.31	+238	2310	3.01	2548	3.32	2054	2.67	494	0.65
June	5.53	5.81	4.92	3.59	+0.53	+407	2549	3.32	2956	3.85	2246	2.92	710	0.93
July	6.06	6.32	5.26	4.21	+0.22	+169	2400	3.12	2569	3.34	2299	2.99	270	0.35
Aug.	6.28	6.24	5.15	4.03	-0.14	-108	2436	3.17	2328	3.03	2208	2.87	120	0.16
Sept.	6.14	6.04	5.21	3.87	-0.32	-246	2655	3.46	2409	3.14	2143	2.79	266	0.35
Oct.	5.82	5.60	4.67	3.44	-0.36	-277	2387	3.11	2110	2.75	2066	2.69	44	0.06
Nov.	5.46	5.33	4.36	3.09	-0.20	-154	2323	3.02	2169	2.82	1978	2.57	191	0.25
Dec.	5.26	5.20	4.35	3.10	-0.22	-169	2304	3.00	2135	2.78	1973	2.57	162	0.21
1893														
Jan.	5.04	4.87	4.04	2.27	-0.22	-169	²¹ 1752	2.28	1583	2.06	1806	2.35	-223	-0.29
Feb.	4.82	4.76	3.93	1.71	+0.18	+138	²⁷ 1915	2.49	2053	2.67	1796	2.34	257	0.33
Mar.	5.00	5.24	4.39	2.29	+0.62	+476	²⁷ 2077	2.70	2553	3.32	1861	2.42	692	0.90
April	5.62	5.99	5.09	3.66	+0.95	+730	2353	3.06	3083	4.01	2006	2.61	1077	1.40
May	6.57	7.15	6.19	4.80	+0.69	+530	3040	3.96	3570	4.65	2174	2.83	1396	1.82
June	7.26	7.37	6.39	5.12	-0.02	- 15	2994	3.90	2979	3.88	2258	2.94	721	0.94
July	7.24	7.11	6.15	4.81	-0.40	-307	2980	3.88	2673	3.48	2224	2.89	449	0.59
Aug.	6.84	6.57	5.64	4.27	-0.40	-307	2826	3.68	2519	3.28	2086	2.71	433	0.57
Sept.	6.44	6.30	5.39	4.17	-0.40	-307	2608	3.39	2301	2.99	2028	2.64	273	0.35
Oct.	6.04	5.78	4.90	3.60	-0.46	-353	2519	3.28	2166	2.82	2006	2.61	160	0.21
Nov.	5.58	5.37	4.51	3.20	-0.28	-215	2400	3.12	2185	2.84	2001	2.60	184	0.24
Dec.	5.30	5.22	4.37	3.08	+0.09	+ 69	2339	3.04	2408	3.13	1993	2.59	415	0.54
1894														
Jan.	5.39	5.56	4.69	3.16	+0.26	+200	2297	2.99	2497	3.25	1993	2.59	504	0.66
Feb.	5.65	5.74	4.86	2.44	+0.24	+184	²¹ 1990	2.59	2174	2.83	1908	2.48	266	0.35
Mar.	5.89	6.04	5.14	3.49	+0.17	+131	²⁷ 2428	3.16	2559	3.33	1931	2.51	628	0.82
April	6.06	6.09	5.19	3.82	+0.12	+ 92	2673	3.48	2765	3.60	1974	2.57	791	1.03
May	6.18	6.27	5.36	4.04	+0.36	+277	2687	3.50	2964	3.86	2088	2.72	876	1.14
June	6.54	6.80	5.86	4.61	+0.16	+123	2793	3.64	2916	3.80	2181	2.84	735	0.96
July	6.70	6.60	5.67	4.40	-0.39	-300	2746	3.57	2446	3.18	2150	2.80	296	0.38
Aug.	6.31	6.02	5.12	3.81	-0.55	-423	2600	3.38	2177	2.83	2040	2.66	137	0.17
Sept.	5.76	5.51	4.64	3.37	-0.38	-292	2410	3.14	2118	2.76	2002	2.61	116	0.11
Oct.	5.38	5.26	4.40	3.15	-0.28	-215	2319	3.02	2104	2.74	2002	2.61	102	0.13
Nov.	5.10	4.93	4.09	2.95	-0.34	-261	2136	2.78	1875	2.44	1962	2.55	- 87	-0.11
Dec.	4.76	4.58	3.76	2.39	-0.22	-169	2206	2.87	2037	2.65	1923	2.50	114	0.15

a.—Niagara River discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
NOTE.—21, 24 and 27 indicate that St. Lawrence River discharges were derived from gage observations taken at Locks 21, 24 and 27, respectively.

TABLE 27.—Continued.
SUPPLY FACTORS OF LAKE ONTARIO.

DATE	WATER LEVELS OF—				STORAGE IN LAKE ONTARIO		OUTFLOW THROUGH ST. LAWRENCE RIVER		TOTAL SUPPLY TO LAKE ONTARIO		INFLOW FROM NIAGARA RIVER. <i>a</i>		LOCAL SUPPLY TO LAKE ONTARIO	
	LAKE ONTARIO		ST. LAWRENCE RIVER.											
	OSWEGO, N.Y.		Ogdens- burg, N.Y., Mean of Month.	Lock 27, Head of Galop Canal, Mean of Month.										
	First of Month.	Mean of Month.			Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Ontario.	100 c.f.s.	Feet Depth	100 c.f.s.	Feet Depth, Lake Ontario	100 c.f.s.	Foot Depth.
1895														
Jan.	244.54	244.49	243.68	242.16	-0.08	- 62	1989	2.59	1927	2.51	1896	2.47	31	0.04
Feb.	4.46	4.43	3.62	1.32	-0.08	- 62	²¹ 1659	2.16	1597	2.08	1749	2.28	-152	-0.20
Mar.	4.38	4.33	3.53	1.59	+0.22	+169	²¹ 1774	2.31	1943	2.53	1733	2.26	210	0.27
April	4.60	4.88	4.05	2.64	+0.34	+261	2034	2.65	2295	2.99	1777	2.31	518	0.68
May	4.94	5.00	4.16	2.97	0.00	0	2197	2.86	2197	2.86	1850	2.41	347	0.45
June	4.94	4.88	4.05	2.81	-0.20	-154	2202	2.87	2048	2.67	1872	2.44	176	0.23
July	4.74	4.59	3.77	2.51	-0.28	-215	2134	2.78	1919	2.50	1867	2.43	52	0.07
Aug.	4.46	4.34	3.54	2.36	-0.29	-223	2006	2.61	1783	2.32	1838	2.39	- 55	-0.07
Sept.	4.17	4.00	3.22	2.11	-0.34	-261	1866	2.43	1605	2.09	1842	2.40	-237	-0.31
Oct.	3.83	3.66	2.90	1.77	-0.29	-223	1794	2.33	1571	2.04	1792	2.33	-221	-0.29
Nov.	3.54	3.41	2.66	1.56	-0.12	- 92	1710	2.23	1618	2.11	1691	2.20	-73	-0.09
Dec.	3.42	3.44	2.69	1.72	+0.20	+154	1625	2.11	1779	2.31	1744	2.27	35	0.04
1896														
Jan.	3.62	3.80	3.03	1.80	+0.41	+315	²⁴ 1825	2.38	2140	2.79	1775	2.31	365	0.48
Feb.	4.03	4.26	3.46	1.93	+0.35	+269	1932	2.51	2201	2.86	1760	2.29	441	0.57
Mar.	4.38	4.49	3.68	1.86	+0.57	+438	²⁷ 1956	2.55	2394	3.12	1687	2.20	707	0.92
April	4.95	5.41	4.55	3.06	+0.47	+361	2230	2.90	2591	3.37	1796	2.34	795	1.03
May	5.42	5.43	4.57	3.46	-0.03	- 23	2252	2.93	2229	2.90	1891	2.46	338	0.44
June	5.39	5.35	4.49	3.29	-0.17	-131	2306	3.00	2175	2.83	1893	2.46	282	0.37
July	5.22	5.08	4.24	3.17	-0.21	-161	2120	2.76	1959	2.55	1932	2.51	27	0.04
Aug.	5.01	4.94	4.10	3.02	-0.31	-238	2088	2.72	1850	2.41	1983	2.58	-133	-0.17
Sept.	4.70	4.46	3.65	2.54	-0.36	-277	1985	2.58	1708	2.22	1891	2.46	-183	-0.24
Oct.	4.34	4.23	3.43	2.32	-0.24	-184	1924	2.50	1740	2.26	1836	2.39	- 96	-0.13
Nov.	4.10	3.97	3.19	2.22	-0.13	-100	1754	2.28	1654	2.15	1842	2.40	-188	-0.25
Dec.	3.97	3.97	3.19	2.04	-0.05	- 38	1648	2.14	1610	2.09	1797	2.34	-187	-0.25
1897														
Jan.	3.92	3.88	3.10	1.91	-0.07	- 54	1890	2.46	1836	2.39	1875	2.44	- 39	-0.05
Feb.	3.85	3.82	3.05	1.75	+0.22	+169	²⁴ 1783	2.32	1952	2.54	1781	2.32	171	0.22
Mar.	4.07	4.32	3.52	2.25	+0.57	+438	²¹ 1976	2.57	2414	3.14	1888	2.46	526	0.68
April	4.64	4.96	4.12	3.12	+0.54	+415	2022	2.63	2437	3.17	2004	2.61	433	0.56
May	5.18	5.40	4.54	3.34	+0.32	+246	2321	3.02	2567	3.34	2101	2.73	466	0.61
June	5.50	5.61	4.73	3.73	+0.11	+ 84	2198	2.86	2282	2.97	2097	2.73	185	0.24
July	5.61	5.61	4.73	3.64	-0.01	- 8	2280	2.97	2272	2.96	2093	2.72	179	0.24
Aug.	5.60	5.60	4.73	3.63	-0.25	-192	2290	2.98	2098	2.73	2066	2.69	32	0.04
Sept.	5.35	5.10	4.25	3.07	-0.57	-438	2215	2.88	1777	2.31	1984	2.58	-207	-0.27
Oct.	4.78	4.47	3.66	2.57	-0.34	-261	1972	2.57	1711	2.23	1886	2.45	-175	-0.22
Nov.	4.44	4.41	3.60	2.30	0.00	0	2108	2.74	2108	2.74	1895	2.47	213	0.27
Dec.	4.44	4.47	3.66	2.37	+0.12	+ 92	2120	2.76	2212	2.88	1921	2.50	291	0.38
1898														
Jan.	4.56	4.64	3.82	2.44	+0.30	+230	²¹ 2074	2.70	2304	3.00	1893	2.46	411	0.53
Feb.	4.86	5.08	4.24	2.52	+0.42	+323	²⁷ 2143	2.79	2466	3.21	1870	2.43	596	0.78
Mar.	5.28	5.48	4.61	3.58	+0.42	+323	2191	2.85	2514	3.27	1951	2.54	563	0.73
April	5.70	5.92	5.03	3.21	+0.30	+230	2580	3.36	2810	3.66	2088	2.72	722	0.94
May	6.00	6.08	5.18	3.54	+0.10	+ 77	2878	3.75	2955	3.85	2119	2.76	836	1.09
June	6.10	6.13	5.23	3.59	-0.11	- 84	2898	3.77	2814	3.66	2128	2.77	686	0.89
July	5.99	5.85	4.96	3.32	-0.31	-238	2801	3.65	2563	3.34	2077	2.70	486	0.64
Aug.	5.68	5.50	4.63	3.24	-0.38	-292	2501	3.26	2209	2.88	2068	2.69	141	0.19
Sept.	5.30	5.09	4.24	2.85	-0.34	-261	2372	3.09	2111	2.75	1981	2.58	130	0.17
Oct.	4.96	4.84	4.01	2.58	-0.10	- 77	2327	3.03	2250	2.93	1943	2.53	307	0.40
Nov.	4.86	4.89	4.06	2.56	+0.04	+ 31	2390	3.11	2421	3.15	1965	2.56	456	0.59
Dec.	4.90	4.90	4.07	2.61	+0.04	+ 31	2069	2.69	2100	2.73	1978	2.57	122	0.16
1899														
Jan.	4.94	4.98	4.14	2.70	-0.01	- 8	2078	2.70	2070	2.69	1974	2.57	96	0.12
Feb.	4.93	4.88	4.05	2.24	+0.07	+ 54	²¹ 2063	2.69	2117	2.76	1875	2.44	242	0.31
Mar.	5.00	5.13	4.28	2.72	+0.41	+315	2190	2.85	2505	3.26	1929	2.51	576	0.75
April	5.41	5.69	4.81	3.35	+0.41	+315	2289	2.98	2604	3.39	1973	2.57	631	0.82
May	5.82	5.94	5.05	3.66	+0.18	+138	2644	3.44	2782	3.62	2036	2.65	746	0.97
June	6.00	6.07	5.17	3.84	0.00	0	2634	3.43	2634	3.43	2079	2.71	555	0.72
July	6.00	5.92	5.03	3.68	-0.31	-238	2603	3.39	2365	3.08	2066	2.69	299	0.39
Aug.	5.69	5.46	4.59	3.27	-0.49	-376	2434	3.17	2058	2.68	1983	2.58	75	0.10
Sept.	5.20	4.95	4.11	2.81	-0.45	-346	2266	2.95	1920	2.50	1941	2.53	- 21	-0.03
Oct.	4.75	4.55	3.74	2.40	-0.27	-208	2180	2.84	1972	2.57	1850	2.41	122	0.16
Nov.	4.48	4.42	3.61	2.28	-0.09	- 69	2135	2.78	2066	2.69	1866	2.43	200	0.26
Dec.	4.39	4.36	3.56	2.35	-0.11	+ 84	2034	2.65	2118	2.76	1954	2.54	164	0.22

a.—Niagara River discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
NOTE.—21, 24 and 27 indicate that St. Lawrence River discharges were derived from gage observations taken at Locks 21, 24 and 27 respectively.

SESSIONAL PAPER No. 54.

TABLE 27.—Continued.

SUPPLY FACTORS OF LAKE ONTARIO.

DATE	WATER LEVELS OF—				STORAGE IN LAKE ONTARIO		OUTFLOW THROUGH ST. LAWRENCE RIVER		TOTAL SUPPLY TO LAKE ONTARIO		INFLOW FROM NIAGARA RIVER. <i>a</i>		LOCAL SUPPLY TO LAKE ONTARIO	
	LAKE ONTARIO		ST. LAWRENCE RIVER.											
	OSWEGO, N.Y.		Ogdens- burg, N.Y., Mean of Month.	Lock 27. Head of Galop Canal, Mean of Month.										
	First of Month.	Mean of Month.			Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Ontario.	100 c.f.s.	Feet Depth	100 c.f.s.	Feet Depth, Lake Ontario	100 c.f.s.	Foot Depth.
1900														
Jan.	244.50	244.63	243.81	242.30	+0.26	+200	2022	2.63	2222	2.89	1891	2.46	331	0.43
Feb.	4.76	4.88	4.05	2.35	+0.28	+215	²⁴ 2063	2.69	2278	2.96	1878	2.44	400	0.52
Mar.	5.04	5.19	4.34	2.35	+0.46	+353	²¹ 1566	2.04	1919	2.50	1923	2.50	— 4	−0.01
April	5.50	5.80	4.91	3.38	+0.40	+307	2365	3.08	2672	3.48	1999	2.60	673	0.88
May	5.90	5.99	5.09	3.54	+0.05	+ 38	2781	3.62	2819	3.67	2038	2.65	781	1.02
June	5.95	5.91	5.02	3.70	−0.09	− 69	2575	3.35	2506	3.26	2056	2.68	450	0.58
July	5.86	5.82	4.93	3.64	−0.18	−138	2520	3.28	2382	3.10	2061	2.68	321	0.42
Aug.	5.68	5.54	4.67	3.26	−0.35	−269	2530	3.29	2261	2.94	2034	2.65	227	0.29
Sept.	5.33	5.12	4.14	3.01	−0.41	−315	2141	2.79	1826	2.38	1978	2.57	−152	−0.19
Oct.	4.92	4.72	3.85	2.62	−0.28	−215	2135	2.78	1920	2.50	1893	2.46	27	0.04
Nov.	4.64	4.55	3.69	2.37	+0.06	+ 46	2151	2.80	2197	2.86	1927	2.51	270	0.35
Dec.	4.70	4.84	3.96	2.65	+0.06	+ 46	2226	2.90	2272	2.96	1912	2.49	360	0.47
1901														
Jan.	4.76	4.68	3.78	2.48	−0.11	− 84	²⁷ 2131	2.77	2047	2.66	1876	2.44	171	0.22
Feb.	4.65	4.62	3.55	2.13	−0.15	−115	1898	2.47	1783	2.32	1755	2.28	28	0.04
Mar.	4.50	4.39	3.38	1.88	+0.51	+392	1893	2.46	2285	2.97	1712	2.23	573	0.75
April	5.01	5.63	4.35	3.02	+0.76	+584	2364	3.08	2948	3.84	1760	2.29	1188	1.55
May	5.77	5.91	4.82	3.58	+0.18	+138	2442	3.18	2580	3.36	1786	2.32	794	1.04
June	5.95	5.99	4.99	3.70	−0.09	− 69	2538	3.30	2469	3.21	1896	2.47	573	0.75
July	5.86	5.74	4.81	3.50	−0.28	−215	2496	3.25	2281	2.97	1936	2.52	345	0.45
Aug.	5.58	5.42	4.53	3.21	−0.32	−246	2414	3.14	2168	2.82	1897	2.47	271	0.35
Sept.	5.26	5.10	4.26	2.97	−0.38	−292	2305	3.00	2013	2.62	1908	2.48	105	0.14
Oct.	4.88	4.65	3.84	2.46	−0.42	−323	2238	2.91	1915	2.49	1861	2.42	54	0.07
Nov.	4.46	4.28	3.44	2.00	−0.14	−108	2152	2.80	2044	2.66	1831	2.38	213	0.28
Dec.	4.32	4.36	3.54	2.18	+0.07	+ 54	2133	2.78	2187	2.85	1827	2.38	360	0.47
1902														
Jan.	4.39	4.42	3.57	1.24	−0.03	− 23	²⁷ 1780	2.32	1757	2.29	1836	2.39	− 79	−0.10
Feb.	4.36	4.30	3.57	0.24	+0.26	+200	²⁷ 1522	1.98	1722	2.24	1706	2.22	16	0.02
Mar.	4.62	4.95	4.14	2.44	+0.56	+430	²⁷ 2120	2.76	2550	3.32	1739	2.26	811	1.06
April	5.18	5.40	4.67	3.24	+0.26	+200	2227	2.90	2427	3.16	1855	2.41	572	0.74
May	5.44	5.47	4.62	3.34	+0.07	+ 54	2411	3.14	2465	3.21	1906	2.48	559	0.73
June	5.51	5.55	4.71	3.44	+0.25	+192	2434	3.17	2626	3.42	1975	2.57	651	0.85
July	5.76	5.97	5.06	3.74	+0.28	+215	2590	3.37	2805	3.65	2130	2.77	675	0.88
Aug.	6.04	6.11	5.12	3.84	−0.16	−123	2573	3.35	2450	3.19	2110	2.75	340	0.44
Sept.	5.88	5.66	4.80	3.54	−0.34	−261	2451	3.19	2190	2.85	2031	2.64	159	0.21
Oct.	5.54	5.42	4.51	3.28	−0.30	−230	2337	3.04	2107	2.74	2053	2.67	54	0.07
Nov.	5.24	5.05	4.21	3.04	−0.27	−208	2196	2.86	1988	2.59	1995	2.60	−7	−0.01
Dec.	4.97	4.89	4.06	2.74	−0.07	− 54	2265	2.95	2211	2.88	2009	2.61	202	0.26
1903														
Jan.	4.90	4.92	3.97	2.54	+0.14	+108	²⁴ 1970	2.56	2078	2.70	1961	2.55	117	0.15
Feb.	5.04	5.16	4.00	2.54	+0.42	+323	2049	2.67	2372	3.09	1897	2.47	475	0.62
Mar.	5.46	5.75	4.68	3.24	+0.64	+492	2236	2.91	2728	3.55	1992	2.59	736	0.96
April	6.10	6.44	5.48	4.14	+0.40	+307	2746	3.57	3053	3.97	2154	2.80	899	1.17
May	6.50	6.56	5.60	4.34	0.00	0	2711	3.53	2711	3.53	2159	2.81	552	0.72
June	6.50	6.44	5.43	4.14	+0.02	+ 15	2681	3.49	2696	3.51	2184	2.84	512	0.67
July	6.52	6.59	5.57	4.24	−0.05	− 31	2769	3.60	2738	3.56	2194	2.86	544	0.71
Aug.	6.47	6.35	5.35	4.04	−0.26	−200	2673	3.48	2473	3.22	2110	2.75	363	0.47
Sept.	6.21	6.07	5.13	3.54	−0.31	−238	2672	3.48	2434	3.17	2088	2.72	346	0.45
Oct.	5.90	5.72	4.70	3.44	−0.36	−277	2289	2.98	2012	2.62	2045	2.66	− 33	−0.04
Nov.	5.54	5.36	4.47	3.14	−0.30	−230	2272	2.96	2042	2.66	1966	2.56	76	0.10
Dec.	5.24	5.11	4.24	3.04	−0.32	−246	2176	2.83	1930	2.51	1968	2.56	− 38	−0.05
1904														
Jan.	4.92	4.72	3.90	2.54	−0.06	− 46	²⁴ 1973	2.57	1927	2.51	1762	2.29	165	0.21
Feb.	4.86	5.00	4.04	2.54	+0.46	+353	1969	2.56	2322	3.02	1813	2.36	509	0.66
Mar.	5.32	5.63	4.47	3.04	+1.00	+768	2048	2.67	2816	3.67	1931	2.51	885	1.16
April	6.32	7.00	5.86	4.54	+0.98	+753	2369	3.08	3122	4.06	2170	2.82	952	1.24
May	7.30	7.61	6.45	5.35	+0.44	+338	2675	3.48	3013	3.92	2252	2.93	761	0.99
June	7.74	7.87	6.75	5.54	+0.14	+108	2888	3.76	2996	3.90	2317	3.02	679	0.88
July	7.88	7.89	6.82	5.74	−0.12	− 92	2767	3.60	2675	3.48	2296	2.99	379	0.49
Aug.	7.76	7.64	6.64	5.38	−0.32	−246	2904	3.78	2658	3.46	2225	2.90	433	0.56
Sept.	7.44	7.25	6.22	5.00	−0.38	−292	2726	3.55	2434	3.17	2157	2.81	277	0.36
Oct.	7.06	6.87	5.89	4.65	−0.44	−338	2640	3.44	2302	3.00	2103	2.74	199	0.26
Nov.	6.62	6.36	5.36	4.08	−0.54	−415	2508	3.26	2093	2.72	2033	2.65	60	0.07
Dec.	6.08	5.81	4.81	3.34	−0.28	−215	2169	2.82	1954	2.54	1993	2.59	− 39	−0.05

a.—Niagara River discharge values include a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
NOTE.—21, 24 and 27 indicate that St. Lawrence River discharges were derived from gage observations taken at Locks 21, 24 and 27, respectively.

TABLE 27.—Continued.
SUPPLY FACTORS OF LAKE ONTARIO.

DATE	WATER LEVELS OF—				STORAGE IN LAKE ONTARIO		OUTFLOW THROUGH ST. LAWRENCE RIVER		TOTAL SUPPLY TO LAKE ONTARIO		INFLOW FROM NIAGARA RIVER. <i>a</i>		LOCAL SUPPLY TO LAKE ONTARIO	
	LAKE ONTARIO		ST. LAWRENCE RIVER.											
	OSWEGO, N.Y.		Ogdens- burg, N.Y., Mean of Month.	Lock 27, Head of Galop Canal, Mean of Month.										
	First of Month.	Mean of Month.			Foot Depth.	100 c.f.s.	100 c.f.s.	Feet Depth, Lake Ontario.	100 c.f.s.	Feet Depth	100 c.f.s.	Feet Depth, Lake Ontario	100 c.f.s.	Foot Depth.
1905														
Jan.	245.80	245.79	244.91	243.08	−0.16	−123	²¹ 1968	2.56	1845	2.40	1906	2.48	− 61	−0.08
Feb.	5.64	5.49	4.53	2.78	−0.25	−192	²¹ 1779	2.32	1587	2.07	1797	2.34	−210	−0.27
Mar.	5.39	5.29	4.24	2.44	+0.32	+246	²¹ 1886	2.45	2132	2.77	1816	2.36	316	0.41
April	5.71	6.13	5.09	3.68	+0.48	+369	2211	2.88	2580	3.36	1917	2.49	663	0.86
May	6.19	6.25	5.28	4.04	+0.23	+177	2449	3.19	2626	3.42	2049	2.67	577	0.75
June	6.42	6.59	5.64	4.28	+0.36	+277	2666	3.47	2943	3.83	2188	2.85	755	0.98
July	6.78	6.98	5.95	4.70	+0.16	+123	2668	3.47	2791	3.36	2264	2.95	527	0.69
Aug.	6.94	6.90	5.85	4.44	−0.12	− 92	2778	3.62	2686	3.50	2209	2.87	477	0.62
Sept.	6.82	6.75	5.76	4.44	−0.22	−169	2671	3.48	2502	3.26	2161	2.81	341	0.44
Oct.	6.60	6.45	5.48	4.28	−0.34	−261	2475	3.22	2214	2.88	2112	2.75	102	0.13
Nov.	6.26	6.07	5.24	3.88	−0.28	−215	2536	3.30	2321	3.02	2029	2.64	292	0.38
Dec.	5.98	5.88	5.03	3.58	+0.02	+ 15	2220	2.89	2235	2.91	2066	2.69	169	0.22
1906														
Jan.	6.00	6.13	5.30	3.98	+0.11	+ 84	²¹ 2403	3.13	2487	3.24	2038	2.65	449	0.58
Feb.	6.11	6.09	5.11	3.66	−0.11	− 84	2244	2.92	2160	2.81	1936	2.52	224	0.29
Mar.	6.00	5.91	4.95	3.51	+0.08	+ 62	2191	2.85	2253	2.93	1889	2.46	364	0.47
April	6.08	6.25	5.21	3.86	+0.24	+184	2518	3.28	2702	3.52	1977	2.57	725	0.94
May	6.32	6.38	5.38	4.01	+0.08	+ 62	2589	3.37	2651	3.45	2025	2.64	626	0.81
June	6.40	6.41	5.42	4.14	+0.09	+ 69	2527	3.29	2596	3.38	2075	2.70	521	0.68
July	6.49	6.57	5.56	4.24	−0.07	− 54	2606	3.39	2552	3.32	2091	2.72	461	0.60
Aug.	6.42	6.26	5.31	3.96	−0.38	−292	2551	3.32	2259	2.94	2078	2.70	181	0.24
Sept.	6.04	5.81	4.92	3.52	−0.40	−307	2464	3.21	2157	2.81	2025	2.64	132	0.17
Oct.	5.64	5.48	4.68	3.42	−0.11	− 84	2283	2.97	2199	2.86	2020	2.63	179	0.23
Nov.	5.53	5.58	4.62	3.38	+0.13	+100	2249	2.93	2349	3.06	2036	2.65	313	0.41
Dec.	5.66	5.74	4.64	3.29	+0.38	+292	2339	3.04	2631	3.42	2066	2.69	565	0.74
1907														
Jan.	6.04	6.34	5.20	3.35	+0.36	+277	²¹ 2266	2.95	2543	3.31	2185	2.84	358	0.47
Feb.	6.40	6.46	5.42	3.47	+0.06	+ 46	²¹ 2207	2.87	2253	2.93	2070	2.69	183	0.24
Mar.	6.46	6.47	5.32	3.63	+0.20	+154	²¹ 2291	2.98	2445	3.18	2014	2.62	431	0.56
April	6.66	6.85	5.74	4.42	+0.30	+230	2664	3.47	2894	3.77	2105	2.74	789	1.03
May	6.96	7.08	6.03	4.73	+0.14	+108	2741	3.57	2849	3.71	2157	2.81	692	0.90
June	7.10	7.11	6.05	4.78	+0.02	+ 15	2720	3.54	2735	3.56	2239	2.91	496	0.65
July	7.12	7.12	6.12	4.85	−0.11	− 84	2742	3.57	2658	3.46	2276	2.96	382	0.50
Aug.	7.01	6.90	5.90	4.63	−0.31	−238	2672	3.48	2434	3.17	2200	2.86	234	0.30
Sept.	6.70	6.50	5.51	4.19	−0.21	−181	2590	3.37	2429	3.16	2148	2.80	281	0.37
Oct.	6.49	6.48	5.42	4.16	−0.09	− 69	2509	3.27	2440	3.18	2145	2.79	295	0.38
Nov.	6.40	6.33	5.31	4.06	−0.07	− 54	2467	3.21	2413	3.14	2126	2.77	287	0.37
Dec.	6.33	6.33	5.34	3.93			2284	2.97			2108	2.74		

Niagara River discharge values indicate a flow of 1000 c.f.s. through Erie Canal and 1100 c.f.s. through Welland Canal.
NOTE.—²¹, ²⁴ and ²⁷ indicate that St. Lawrence River discharges were derived from gage observations taken at Locks 21, 24 and 27, respectively.

TABLE 28. MEAN MONTHLY SUPPLY FACTORS OF THE GREAT LAKES, 1860-1907, INCLUSIVE.

SESSIONAL PAPER No. 54.

SUPPLY FACTORS.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
LAKE SUPERIOR.												
Stage, in feet above mean sea level.	602.03	601.85	601.77	601.86	602.16	602.42	602.63	602.73	602.79	602.74	602.56	602.26
Storage, in 100 c.f.s.	-718	-409	-13	+650	+959	+809	+525	+267	+6	-385	-803	-911
Outflow, in 10 ⁹ c.f.s.	741	701	680	703	798	857	908	927	928	913	875	804
Total Supply, in 100 c.f.s.	23	292	668	1353	1757	1666	1433	1193	934	528	73	-107
Local Supply, in 100 c.f.s.	23	292	668	1353	1757	1666	1433	1193	934	528	73	-107
LAKE MICHIGAN-HURON.—a.												
Stage, in feet above mean sea level.	580.93	580.93	581.05	581.25	581.55	581.79	581.90	581.86	581.67	581.45	581.21	580.99
Storage, in 100 c.f.s.	-265	+286	+792	+1222	+1323	+864	+150	-571	-987	-1122	-1120	-794
Outflow, in 100 c.f.s.—b	1919	1763	1873	2003	2053	2155	2202	2204	2163	2117	2082	2052
Total Supply, in 100 c.f.s.	1654	2049	2664	3225	3377	3019	2352	1633	1176	995	962	1258
Local Supply, in 100 c.f.s.	913	1347	1984	2522	2578	2162	1442	706	247	82	87	453
LAKE ERIE.												
Stage, in feet above mean sea level.	572.10	572.03	572.22	572.70	573.05	573.24	573.22	573.04	572.78	572.45	572.21	572.14
Storage, in 100 c.f.s.	-68	+59	+366	+441	+276	+90	-108	-232	-311	-303	-165	-64
Outflow, in 100 c.f.s.—c	2044	1981	2012	2116	2192	2251	2263	2203	2152	2095	2063	2085
Total Supply, in 100 c.f.s.	1976	2040	2378	2557	2469	2340	2154	1971	1841	1792	1898	2020
Local Supply, in 100 c.f.s.	+64	+284	+513	+561	+422	+192	-41	-227	-316	-318	-177	-24
LAKE ONTARIO.												
Stage, in feet above mean sea level.	245.58	245.65	245.91	246.49	246.82	246.95	246.93	246.63	246.22	245.88	245.63	245.57
Storage, in 100 c.f.s.	+28	+127	+323	+348	+179	+44	-124	-273	-287	-226	-120	-24
Outflow, in 100 c.f.s.	2228	2193	2333	2606	2795	2835	2836	2750	2621	2526	2450	2341
Total Supply, in 100 c.f.s.	2255	2320	2656	2954	2975	2880	2712	2477	2334	2300	2329	2318
Local Supply, in 100 c.f.s.	211	340	644	838	782	629	449	274	182	206	266	228

a.—Lake St. Clair included as part of Lake Michigan-Huron Watershed.
b.—This quantity includes the flow through the Chicago Drainage Canal since 1900.
c.—This quantity includes a flow of 1000 c.f.s. through the Erie Canal, and 1100 c.f.s. through the Welland Canal.

TABLE 31

MEAN MONTHLY SUPPLY FACTORS OF THE GREAT LAKES EXPRESSED IN CUBIC FEET
PER SECOND PER SQUARE MILE OF WATERSHED, 1860-1907 INCLUSIVE.

SUPPLY FACTORS.	JAN.	FEB.	MAR.	APR. L.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
LAKE SUPERIOR.												
Storage, c.f.s. per square mile.....	-0.94	-0.51	-0.02	+0.85	+1.26	+1.06	+0.69	+0.35	+0.01	-0.51	-1.06	-1.20
Outflow, c.f.s. per square mile.....	0.97	0.92	0.89	0.92	1.05	1.13	1.19	1.22	1.22	1.20	1.15	1.06
Total Supply, c.f.s. per square mile.....	0.03	0.38	0.88	1.78	2.31	2.19	1.88	1.57	1.23	0.69	0.10	-0.14
Local Supply, c.f.s. per square mile.....	0.03	0.38	0.88	1.78	2.31	2.19	1.88	1.57	1.23	0.69	0.10	-0.14
LAKE MICHIGAN-HURON.—a.												
Storage, c.f.s. per square mlie.....	-0.12	+0.13	+0.36	+0.56	+0.60	+0.39	+0.07	-0.26	-0.45	-0.51	-0.51	-0.36
Outflow, c.f.s. per square mile.—b.....	0.87	0.80	0.85	0.91	0.93	0.98	1.00	1.00	0.98	0.96	0.95	0.93
Total Supply, c.f.s. per square mile.....	0.75	0.93	1.21	1.46	1.53	1.37	1.07	0.74	0.53	0.45	0.44	0.57
Local Supply, c.f.s. per square mile.....	0.63	0.94	1.38	1.75	1.50	1.00	1.00	0.49	0.17	0.06	0.06	0.32
LAKE ERIE.												
Storage, c.f.s per square mile.....	-0.03	+0.02	+0.14	+0.17	+0.11	+0.04	-0.04	-0.09	-0.12	-0.12	-0.06	-0.02
Outflow, c.f.s. per square mile.—c.....	0.80	0.78	0.79	0.83	0.86	0.88	0.89	0.86	0.84	0.82	0.81	0.82
Total Supply, c.f.s per square mile.....	0.78	0.80	0.93	1.00	0.97	0.92	0.85	0.77	0.72	0.70	0.74	0.79
Local Supply c.f.s. per square mlie.....	+0.18	+0.82	+1.48	+1.62	+1.22	+0.56	-0.12	-0.66	-0.91	-0.92	-0.51	-0.07
LAKE ONTARIO.												
Storage, c.f.s per square mile.....	+0.01	+0.04	+0.11	+0.12	+0.06	+0.02	-0.04	-0.10	-0.10	-0.08	-0.04	-0.01
Outflow, c.f.s. per square mile.....	0.77	0.76	0.81	0.91	0.97	0.98	0.99	0.96	0.91	0.88	0.85	0.81
Total Supply, c.f.s. per square mile.....	0.78	0.81	0.92	1.03	1.03	1.00	0.94	0.86	0.81	0.80	0.81	0.81
Local Supply, c.f.s. per square mile.....	0.64	1.03	1.95	2.54	2.37	1.91	1.36	0.83	0.55	0.62	0.81	0.69

a.—Lake St. Clair included as part of Lake Michigan-Huron Watershed.
b.—This quantity includes the flow through the Chicago Drainage Canal since 1900.
c.—This quantity includes the flow through the Erie Canal and through the Welland Canal.

TABLE 33.

REGULATION OF LAKE ERIE BETWEEN STAGES 573.7 AND 574.7.

DATE	WATER LEVELS OF LAKE ERIE.				STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER, 100 c.f.s.	TOTAL SUPPLY TO LAKE ERIE, 100 c.f.s.	EXPECTED CHANGE IN TOTAL SUPPLY OVER PRECEDING MONTH, 100 c.f.s.	EXPECTED TOTAL SUPPLY FOR MONTH, 100 c.f.s.	EXPECTED TOTAL SUPPLY, 100 c.f.s.	REGULATED LAKE LEVEL DESIRED, BUFFALO, N.Y. First of Month.	CHANGE IN STAGE REQUIRED BY LAST OF MONTH Foot Depth.	CHANGE IN OUTFLOW TO GIVE CHANGE IN PRECEDING COLUMN, 100 c.f.s.	EXPECTED REGULATED OUTFLOW FOR MONTH, 100 c.f.s.	REGULATED OUTFLOW FOR FIRST OF MONTH, 100 c.f.s.	REGULATED STORAGE IN LAKE ERIE.		REGULATED LAKE LEVEL, BUFFALO, N.Y. First of Month.	REGULATED LEVEL MINUS REGULATED LEVEL DESIRED, First of Month.	REGULATED LAKE LEVEL, MINUS ACTUAL LAKE LEVEL, BUFFALO, N.Y.		SLUICE GATES.	
	CLEVELAND, O.		BUFFALO, N.Y.		100 c.f.s.	Foot Depth																		
	First of Month	Mean of Month	First of Month	Mean of Month																				
1890																								
Jan.	572.20	572.35	572.64	572.93	+0.32	+338	2157	2495	-44	2304	-191	573.8	-0.10	+106	2410	2374	+121	+0.10	573.80	0.00	1.16	1.11	574.04	Open
Feb.	2.52	2.67	2.84	2.74	+0.21	+222	2112	2334	+64	2559	+225	3.7	-0.20	+211	2770	2400	-66	-0.06	3.90	+0.20	1.06	1.02	3.76	Open
Mar.	2.73	2.79	2.86	2.98	+0.31	+328	2170	2498	+338	2672	+174	3.7	-0.04	+42	2714	2384	+114	+0.10	3.84	+0.14	0.98	0.91	3.89	Open
April	3.04	3.28	3.10	3.23	+0.41	+434	2230	2664	+179	2677	+13	3.8	-0.04	+42	2719	2410	+254	+0.21	3.94	+0.14	0.84	0.79	4.02	Open
May	3.45	3.62	3.41	3.59	+0.59	+370	2321	2691	-88	2576	-115	3.9	-0.15	+159	2735	2466	+225	+0.19	4.15	+0.25	0.74	0.66	4.25	Open
June	3.80	3.99	3.76	3.92	0.00	0	2405	2405	-129	2562	+157	4.0	-0.34	+360	2922	2516	-111	-0.09	4.34	+0.34	0.58	0.52	4.44	Open
July	3.80	3.61	3.78	3.64	-0.42	-444	2333	1889	-186	2219	+330	4.0	-0.25	+264	2483	2483	-594	-0.50	4.25	+0.25	0.47	0.41	4.05	Part
Aug.	3.38	3.15	3.40	3.17	-0.32	-338	2216	1878	-183	1706	-172	4.0	+0.25	-264	1442	1667	+211	+0.20	3.75	-0.25	0.35	0.65	3.82	Min.
Sept.	3.06	2.98	3.00	2.82	-0.18	-190	2131	1941	-130	1748	-193	4.0	+0.05	-53	1695	1695	+246	+0.21	3.95	-0.05	0.95	1.14	3.96	Part
Oct.	2.88	2.79	2.82	2.81	-0.10	-106	2129	2023	-49	1892	-131	4.0	-0.16	+169	2061	2061	-38	-0.03	4.16	+0.16	1.34	1.28	4.09	Part
Nov.	2.78	2.76	2.90	3.00	-0.14	-148	2175	2027	+106	2129	+102	4.0	-0.23	+243	2372	2372	-345	-0.29	4.13	+0.13	1.23	1.10	4.10	Part
Dec.	2.64	2.53	2.87	2.74	-0.22	-233	2112	1879	+122	2149	+270	3.9	-0.04	+42	2191	2191	-312	-0.26	3.84	-0.06	0.97	0.97	3.71	Part
1891																								
Jan.	2.42	2.31	2.61	2.48	-0.12	-127	2051	1924	-44	1835	-89	3.8	+0.12	-127	1708	1708	+216	+0.18	3.58	-0.22	0.97	1.16	3.64	Part
Feb.	2.30	2.29	2.42	2.36	+0.22	+233	2025	2258	+64	1988	-270	3.7	-0.06	+63	2051	2051	+207	+0.17	3.76	+0.06	1.34	1.42	3.78	Part
Mar.	2.52	2.75	2.43	2.50	+0.16	+169	2056	2225	+338	2596	+371	3.7	-0.13	+137	2733	2408	-183	-0.15	3.93	+0.23	1.50	1.36	3.86	Open
April	2.68	2.62	2.56	2.62	-0.15	-159	2085	1926	+179	2404	+478	3.8	+0.12	-127	2277	2277	-351	-0.30	3.78	-0.02	1.22	1.10	3.72	Part
May	2.53	2.44	2.51	2.40	-0.02	-21	2033	2012	-88	1838	-174	3.9	+0.52	-550	1288	1667	+345	+0.33	3.48	-0.42	0.97	1.20	3.60	Min.
June	2.51	2.58	2.39	2.38	+0.02	+21	2029	2050	-129	1883	-167	4.0	+0.19	-201	1682	1682	+368	+0.31	3.81	-0.19	1.42	1.54	3.92	Part
July	2.53	2.48	2.47	2.56	-0.19	-201	2070	1869	-186	1864	-5	4.0	-0.12	+127	1991	1991	-122	-0.10	4.12	+0.12	1.65	1.62	4.18	Part
Aug.	2.31	2.21	2.42	2.27	-0.22	-233	2004	1771	-183	1686	-85	4.0	-0.02	+21	1707	1707	+64	+0.05	4.02	+0.02	1.60	1.74	4.01	Part
Sept.	2.12	2.03	2.18	2.10	-0.28	-296	1965	1659	-130	1641	-28	4.0	-0.07	+74	1715	1715	-46	-0.04	4.07	+0.07	1.89	2.00	4.10	Part
Oct.	1.84	1.65	1.92	1.73	-0.41	-434	1882	1448	-49	1620	+172	4.0	-0.03	+32	1652	1667	-219	-0.21	4.03	+0.03	2.11	2.12	3.85	Min.
Nov.	1.43	1.21	1.70	1.67	-0.19	-201	1870	1669	+106	1554	-115	4.0	+0.08	-85	1469	1667	+2	0.00	3.82	-0.18	2.12	2.13	3.80	Min.
Dec.	1.24	1.28	1.68	1.70	+0.06	+63	1876	1939	+122	1791	-148	3.9	-0.02	+21	1812	1812	+127	+0.11	3.82	-0.08	2.14	2.20	3.90	Part
1892																								
Jan.	1.30	1.31	1.66	1.61	-0.10	-106	1857	1751	-44	1895	+144	3.8	-0.23	+243	2138	2138	-387	-0.32	3.93	+0.13	2.27	2.31	3.92	Part
Feb.	1.20	1.10	1.26	0.92	-0.08	-85	1712	1627	+64	1815	+188	3.7	+0.09	-95	1720	1720	-93	-0.08	3.61	-0.09	2.35	2.43	3.35	Part
Mar.	1.12	1.14	1.02	1.12	+0.30	+317	1754	2071	+338	1965	-106	3.7	+0.27	-286	1679	1679	+392	+0.33	3.53	-0.17	2.51	2.42	3.54	Part
April	1.42	1.70	1.54	1.96	+0.68	+719	1933	2652	+179	2250	-402	3.8	+0.04	-42	2208	2208	+444	+0.37	3.86	+0.06	2.32	2.18	4.14	Part
May	2.10	2.50	2.18	2.40	+0.78	+825	2033	2858	-88	2564	-294	3.9	-0.23	+243	2807	2487	+371	+0.31	4.23	+0.33	2.05	1.90	4.30	Open
June	2.88	3.26	2.80	3.21	+0.44	+465	2225	2690	-129	2729	+39	4.0	-0.54	+571	3300	2571	+119	+0.10	4.54	+0.54	1.74	1.53	4.74	Open

a.—The flow of 1000 c.f.s. through the Erie Canal, and that of 1100 c.f.s. through the Welland Canal have been omitted.

TABLE 33.—Continued. REGULATION OF LAKE ERIE BETWEEN STAGES 573.7 AND 574.7.

DATE	WATER LEVELS OF LAKE ERIE.			STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER, 100 c.f.s. a	TOTAL SUPPLY TO LAKE ERIE, 100 c.f.s. a	EXPECTED CHANGE IN TOTAL SUPPLY OVER PRE- CEDING MONTH, 100 c.f.s.	EXPECTED TOTAL SUPPLY FOR MONTH, 100 c.f.s.	EXPECTED TOTAL SUPPLY MINUS TOTAL SUPPLY, 100 c.f.s.	REGULATED LAKE LEVEL DESIRED, BUFFALO, N.Y. First of Month.	CHANGE IN STAGE RE- QUIRED BY LAST OF MONTH Foot Depth.	CHANGE IN OUTFLOW TO PRECEDING COLUMN, 100 c.f.s.	EXPECTED REGULATED OUTFLOW FOR MONTH, 100 c.f.s.	REGULATED OUTFLOW FOR FIRST OF MONTH, 100 c.f.s.	REGULATED STORAGE IN LAKE ERIE.		REGULATED LAKE LEVEL, BUFFALO, N.Y. First of Month.	REGULATED LEVEL MINUS REGULATED LEVEL DESIRED, First of Month.	REGULATED LAKE LEVEL MINUS ACTUAL LAKE LEVEL, BUFFALO, N.Y.		REGULATED LAKE LEVEL, BUFFALO, N.Y. Mean of Month.	SLUICE GATES.
	CLEVELAND, O. BUFFALO, N.Y.		Foot Depth	100 c.f.s.	First of Month											Mean of Month							
	First of Month	Mean of Month																					
1892	573.32	573.38	573.42	-0.12	-127	2278	2151	-186	2504	+353	574.0	-0.64	+677	3181	2598	-447	-0.38	574.64	+0.64	1.32	1.17	574.59	Open
July	3.20	3.03	3.24	-0.33	-349	2187	1838	-183	1968	+130	4.0	-0.26	+275	2243	2243	-405	-0.34	4.26	+0.26	1.02	1.01	4.06	Part
Aug.	2.87	2.71	2.92	-0.44	-465	2122	1657	-130	1708	+51	4.0	+0.08	-85	1623	1667	-10	-0.01	3.92	-0.08	1.00	1.00	3.92	Min.
Sept.	2.43	2.15	2.62	-0.45	-476	2045	1569	-49	1608	+39	4.0	+0.09	-95	1513	1667	-98	-0.09	3.91	-0.09	1.29	1.42	3.87	Min.
Oct.	1.98	1.82	2.26	-0.30	-317	1957	1640	+106	1675	+35	4.0	+0.08	-85	1590	1667	-27	-0.03	3.82	-0.18	1.56	1.64	3.71	Min.
Nov.	1.68	1.55	2.06	-0.32	-338	1952	1614	+122	1762	+148	3.9	+0.01	-11	1751	1751	-137	-0.12	3.79	-0.11	1.73	1.87	3.91	Part
Dec.																							
1893																							
Jan.	1.36	1.17	1.66	-0.15	-159	1785	1626	-44	1570	-56	3.8	+0.03	-32	1538	1667	-41	-0.04	3.67	0.13	2.01	2.20	-3.47	Min
Feb.	1.21	1.25	1.24	+0.15	+159	1775	1934	+64	1690	-244	3.7	+0.07	-74	1616	1667	+267	+0.25	3.63	-0.07	2.39	2.44	3.66	Min.
Mar.	1.36	1.47	1.38	+0.48	+508	1840	2348	+338	2272	-76	3.7	-0.08	+85	2357	2357	-29	-0.01	3.88	+0.18	2.50	2.26	3.79	Part
April	1.84	2.20	1.86	+0.78	+825	1985	2810	+179	2527	-283	3.8	+0.03	-32	2495	2392	+418	+0.35	3.87	+0.07	2.01	1.84	4.03	Open
May	2.62	3.04	2.55	+0.52	+550	2153	2703	-88	2722	+19	3.9	-0.22	+233	2955	2484	+219	+0.18	4.22	+0.32	1.67	1.50	4.41	Open
June	3.14	3.23	3.08	-0.05	-53	2237	2184	-129	2574	+390	4.0	-0.40	+423	2997	2532	-348	-0.29	4.40	+0.40	1.32	1.12	4.38	Open
July	3.09	2.95	3.20	-0.31	-328	2203	1875	-186	1998	+123	4.0	-0.11	+116	2114	2114	-239	-0.20	4.11	+0.11	0.91	0.99	4.12	Part
Aug.	2.78	2.61	2.84	-0.36	-381	2065	1684	-183	1692	+8	4.0	+0.09	-95	1597	1667	+17	+0.02	3.91	-0.09	1.07	1.29	3.83	Min.
Sept.	2.42	2.23	2.42	-0.36	-381	2007	1626	-130	1554	-72	4.0	+0.07	-74	1480	1667	-41	-0.04	3.93	-0.07	1.51	1.58	3.87	Min.
Oct.	2.06	1.88	2.24	-0.38	-402	1985	1583	-49	1577	-6	4.0	+0.11	-116	1461	1667	-84	-0.08	3.89	-0.11	1.65	1.64	3.83	Min.
Nov.	1.68	1.48	2.18	-0.16	-169	1980	1811	+106	1689	-122	4.0	+0.09	-95	1594	1667	+144	+0.14	3.81	-0.19	1.63	1.72	3.89	Min.
Dec.	1.52	1.56	2.15	+0.18	+190	1972	2162	+122	1933	-229	3.9	-0.15	+159	2092	2092	+70	+0.06	3.95	+0.05	1.80	1.84	3.97	Part
1894																							
Jan.	1.70	1.84	2.13	+0.08	+85	1972	2057	-44	2118	+61	3.8	-0.31	+328	2446	2429	-372	-0.31	4.01	+0.21	1.88	1.82	3.95	Open
Feb.	1.78	1.72	1.94	+0.04	-42	1887	1845	+64	2121	+276	3.7	0.00	0	2121	2121	-276	-0.23	3.70	0.00	1.76	1.72	3.47	Part
Mar.	1.74	1.75	1.80	+0.21	+222	1910	2132	+338	2183	+51	3.7	+0.33	-349	1834	1834	+298	+0.25	3.47	-0.23	1.67	1.72	3.58	Part
April	1.95	2.15	1.96	+0.39	+412	1953	2365	+179	2311	-54	3.8	+0.18	-190	2121	2121	+244	+0.21	3.72	-0.08	1.76	1.70	3.75	Part
May	2.34	2.54	2.30	+0.30	+317	2067	2384	-88	2277	-107	3.9	+0.07	-74	2203	2203	+181	+0.15	3.93	+0.03	1.63	1.48	4.03	Part
June	2.64	2.75	2.74	+0.10	+106	2160	2266	-129	2255	-11	4.0	-0.08	+85	2340	2340	-74	-0.06	4.08	+0.08	1.34	1.24	4.18	Part
July	2.74	2.73	2.88	-0.20	-211	2129	1918	-186	2080	+162	4.0	-0.02	+21	2101	2101	-183	-0.15	4.02	+0.02	1.14	1.22	4.03	Part
Aug.	2.54	2.36	2.58	-0.26	-275	2019	1744	-193	1735	-9	4.0	+0.13	-137	1598	1667	+77	+0.07	3.87	-0.13	1.29	1.48	3.82	Min.
Sept.	2.28	2.19	2.26	-0.25	-264	1981	1717	-130	1614	-103	4.0	+0.06	-63	1551	1667	+50	+0.05	3.94	-0.06	1.68	1.75	3.92	Min.
Oct.	2.03	1.87	2.17	-0.28	-296	1981	1685	-49	1668	-17	4.0	+0.01	-11	1657	1667	+18	+0.02	3.99	-0.01	1.82	1.88	4.05	Min.
Nov.	1.75	1.63	2.08	-0.15	-159	1941	1782	+106	1791	+9	4.0	-0.11	+116	1907	1907	-125	-0.11	4.01	+0.01	1.93	1.96	3.95	Part
Dec.	1.60	1.56	1.90	-0.20	-211	1902	1691	+122	1904	+213	3.9	-0.10	+106	2010	2010	-319	-0.27	3.90	0.00	2.00	1.94	3.76	Part

1895	1.40	1.23	1.76	1.69	-0.28	-296	1875	1579	-44	1647	+68	3.8	+0.07	-	74	1573	1667	-88	-0.08	3.63	-0.17	1.87	2.04	3.73	Min.
Jan.	1.12	1.00	1.34	1.00	-0.12	-127	1728	1601	+64	1643	+42	3.7	+0.15	-	159	1484	1667	-66	-0.06	3.55	-0.15	2.21	2.37	3.37	Min.
Feb.	1.00	1.01	0.96	0.92	+0.14	+148	1712	1860	+338	1939	+79	3.7	+0.31	-	328	1611	1667	+193	+0.18	3.49	-0.21	2.53	2.59	3.51	Min.
Mar.	1.14	1.26	1.02	1.13	+0.23	+243	1756	1999	+179	2039	+40	3.8	+0.23	-	243	1796	1796	+203	+0.17	3.67	-0.13	2.65	2.60	3.73	Part
April	1.37	1.48	1.30	1.48	+0.15	+159	1829	1988	-88	1911	-77	3.9	+0.16	-	169	1742	1742	+246	+0.21	3.84	-0.06	2.54	2.53	4.01	Part
May	1.52	1.57	1.53	1.58	0.00	0	1851	1851	-129	1859	+8	4.0	-0.05	+	53	1912	1912	-61	-0.05	4.05	+0.05	2.52	2.48	4.06	Part
June	1.52	1.46	1.57	1.56	-0.10	-106	1846	1740	-186	1665	-75	4.0	0.00	+	0	1665	1667	+73	+0.07	4.00	0.00	2.43	2.50	4.06	Min.
July	1.42	1.38	1.49	1.42	-0.09	-95	1817	1722	-183	1557	-165	4.0	-0.07	+	74	1631	1667	+55	+0.05	4.07	+0.07	2.58	2.64	4.06	Min.
Aug.	1.33	1.28	1.43	1.44	-0.29	-307	1821	1514	-130	1592	+78	4.0	-0.12	+	127	1719	1719	-205	-0.17	4.12	+0.12	2.69	2.66	4.10	Part
Sept.	1.04	0.80	1.32	1.20	-0.29	-307	1771	1464	-49	1465	+1	4.0	+0.05	-	53	1412	1667	-203	-0.19	3.95	-0.05	2.63	2.72	3.92	Min.
Oct.	0.75	0.70	0.96	0.71	+0.03	+32	1670	1702	+106	1570	-132	4.0	+0.14	-	148	1422	1667	+35	+0.03	3.76	-0.24	2.80	2.88	3.59	Min.
Nov.	0.78	0.86	0.84	0.97	+0.13	+137	1723	1860	+122	1824	-36	3.9	+0.01	-	11	1813	1813	+47	+0.04	3.79	-0.11	2.95	2.87	3.84	Part
Dec.	0.91	0.96	1.04	1.12	+0.01	+11	1754	1765	-44	1816	+51	3.8	-0.13	+	137	1953	1953	-188	-0.16	3.83	+0.03	2.79	2.69	3.81	Part
1896	0.92	0.88	1.08	1.05	-0.06	-63	1739	1676	+64	1829	+153	3.7	+0.03	-	32	1797	1797	-121	-0.10	3.67	-0.03	2.59	2.64	3.69	Part
Jan.	0.86	0.83	0.87	0.69	+0.20	+211	1666	1877	+338	2014	+137	3.7	+0.23	-	243	1771	1771	+106	+0.09	3.57	-0.13	2.70	2.70	3.39	Part
Feb.	1.06	1.28	0.96	1.22	+0.41	+434	1775	2209	+179	2056	-153	3.8	+0.24	-	254	1802	1802	+407	+0.34	3.66	-0.14	2.70	2.63	3.85	Part
Mar.	1.47	1.66	1.44	1.67	+0.33	+349	1870	2219	-88	2121	-98	3.9	0.00	+	0	2121	2121	+98	+0.08	4.00	+0.10	2.56	2.48	4.15	Part
April	1.80	1.93	1.68	1.68	+0.07	+74	1872	1946	-129	2090	+144	4.0	-0.08	+	85	2175	2175	-229	-0.19	4.08	+0.08	2.40	2.26	3.94	Part
May	1.87	1.81	1.77	1.86	+0.05	+53	1911	1964	-186	1760	-204	4.0	+0.11	-	116	1644	1667	+297	+0.28	3.89	-0.11	2.12	2.16	4.02	Min.
June	1.92	2.02	1.98	2.09	-0.06	-63	1962	1899	-183	1781	-118	4.0	-0.17	+	180	1961	1961	-62	-0.05	4.17	+0.17	2.19	2.22	4.31	Part
July	1.86	1.70	1.88	1.67	-0.28	-296	1870	1574	-130	1769	+195	4.0	-0.12	+	127	1896	1896	-322	-0.27	4.12	+0.12	2.24	2.28	3.95	Part
Aug.	1.58	1.46	1.54	1.41	-0.30	-317	1815	1498	-49	1525	+27	4.0	+0.15	-	159	1366	1667	-169	-0.16	3.85	-0.15	2.31	2.29	3.70	Min.
Sept.	1.28	1.09	1.42	1.44	-0.18	-190	1821	1631	+106	1604	-27	4.0	+0.21	-	222	1382	1667	-36	-0.03	3.69	-0.31	2.27	2.30	3.74	Min.
Oct.	1.10	1.12	1.34	1.23	0.00	0	1776	1776	+122	1753	-23	3.9	+0.14	-	148	1605	1667	+109	+1.10	3.66	-0.24	2.32	2.34	3.57	Min.
Dec.	1.10	1.09	1.41	1.59	+0.09	+95	1854	1949	-44	1732	-217	3.8	-0.06	+	63	1795	1795	+154	+0.13	3.76	-0.04	2.35	2.44	4.03	Part
1897	1.19	1.29	1.37	1.15	+0.29	+307	1760	2067	+64	2013	-54	3.7	-0.19	+	201	2214	2214	-147	-0.12	3.89	+0.19	2.52	2.44	3.59	Part
Jan.	1.48	1.66	1.40	1.66	+0.46	+486	1867	2353	+338	2405	+52	3.7	+0.03	-	32	2373	2366	-13	-0.01	3.77	+0.07	2.37	2.10	3.76	Open
Feb.	1.94	2.21	1.92	2.18	+0.44	+465	1983	2448	+179	2532	+84	3.8	+0.14	-	148	2384	2364	+84	+0.07	3.76	-0.04	1.84	1.64	3.82	Open
Mar.	2.38	2.54	2.39	2.60	+0.21	+222	2080	2302	-88	2360	+58	3.9	+0.17	-	180	2180	2180	+122	+0.10	3.83	-0.07	1.44	1.38	3.98	Part
April	2.59	2.64	2.60	2.59	+0.05	+53	2076	2129	-129	2173	+44	4.0	+0.07	-	74	2099	2099	+30	+0.03	3.93	-0.07	1.33	1.36	3.95	Part
May	2.64	2.63	2.58	2.57	-0.09	-95	2072	1977	-186	1943	-34	4.0	+0.04	-	42	1901	1901	+76	+0.06	3.96	-0.04	1.38	1.44	4.01	Part
June	2.55	2.47	2.51	2.45	-0.22	-233	2045	1812	-183	1794	-18	4.0	-0.02	+	21	1815	1815	-3	0.00	4.02	+0.02	1.51	1.63	4.08	Part
July	2.33	2.19	2.27	2.09	-0.39	-412	1963	1551	-130	1682	+131	4.0	-0.02	+	21	1703	1703	-152	-0.13	4.02	+0.02	1.75	1.88	3.97	Part
Aug.	1.94	1.70	1.87	1.65	-0.30	-317	1865	1548	-49	1502	-46	4.0	+0.11	-	116	1386	1667	-119	-0.11	3.89	-0.11	2.02	2.06	3.71	Min.
Sept.	1.64	1.57	1.67	1.69	-0.08	-85	1874	1789	+106	1654	-135	4.0	+0.12	-	127	1527	1667	+122	+0.12	3.78	-0.22	2.11	2.13	3.82	Min.
Oct.	1.56	1.54	1.75	1.81	0.00	0	1900	1900	+122	1911	+11	3.9	-0.10	+	106	2017	2017	-117	-0.10	3.90	0.00	2.15	2.10	3.91	Part
Nov.	1.56	1.59	1.74	1.68	+0.13	+137	1872	2009	-44	1856	-153	3.8	-0.10	+	106	1962	1962	+47	+0.04	3.80	0.00	2.06	2.14	3.82	Part
Dec.	1.69	1.79	1.62	1.57	+0.23	+243	1849	2092	+64	2073	-19	3.7	-0.14	+	148	2221	2221	-129	-0.11	3.84	+0.14	2.22	2.10	3.67	Part
1898	1.92	2.05	1.76	1.95	+0.42	+444	1930	2374	+338	2430	+56	3.7	+0.07	-	74	2356	2356	+18	+0.02	3.73	+0.03	1.97	1.74	3.69	Open
Jan.	2.31	2.63	2.25	2.55	+0.36	+381	2067	2448	+179	2553	+105	3.8	+0.15	-	159	2394	2362	+86	+0.07	3.75	-0.05	1.50	1.35	3.90	Open
Feb.	2.70	2.78	2.62	2.68	+0.10	+106	2098	2204	-88	2360	+156	3.9	+0.18	-	190	2170	2170	+34	+0.03	3.82	-0.08	1.20	1.18	3.86	Part
Mar.	2.80	2.81	2.70	2.72	-0.10	-106	2107	2001	-129	2075	+74	4.0	+0.15	-	159	1916	1916	+85	+0.07	3.85	-0.15	1.15	1.23	3.95	Part

.—The flow of 1000 c.f.s. through the Erie Canal and that of 1100 c.f.s. through the Welland Canal have been omitted.

TABLE 33.—Continued. REGULATION OF LAKE ERIE BETWEEN STAGES 573.7 AND 574.7.

DATE	WATER LEVELS OF LAKE ERIE.				STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER, 100 c.f.s. a	TOTAL SUPPLY TO LAKE ERIE, 100 c.f.s. a	EXPECTED CHANGE IN TOTAL SUPPLY OVER PRE- CEDING MONTH, 100 c.f.s.	EXPECTED TOTAL SUPPLY FOR MONTH, 100 c.f.s.	EXPECTED TOTAL SUPPLY, MINUS TOTAL SUPPLY, 100 c.f.s.	REGULATED LAKE LEVEL DESIRED, BUFFALO, N.Y. First of Month.	CHANGE IN STAGE RE- QUIRED BY LAST OF MONTH Foot Depth.	CHANGE IN OUTFLOW TO PRECEDING COLUMN, 100 c.f.s.	EXPECTED REGULATED OUTFLOW FOR MONTH, 100 c.f.s.	REGULATED OUTFLOW FOR FIRST OF MONTH, 100 c.f.s.	REGULATED STORAGE IN LAKE ERIE.		REGULATED LAKE LEVEL, BUFFALO, N.Y. First of Month.	REGULATED LEVEL MINTS First of Month.	REGULATED LAKE LEVEL MINUS ACTUAL LAKE LEVEL, BUFFALO, N.Y.		REGULATED LAKE LEVEL, BUFFALO, N.Y. Mean of Month.	SLUICE GATES.	
	CLEVELAND, O. BUFFALO, N.Y.		Foot Depth	100 c.f.s.																					
	First of Month	Mean of Month			First of Month	Mean of Month																			
1898	July	572.70	572.59	572.61	572.50	-0.21	-222	2056	1834	-186	1815	-19	574.0	+0.08	-	85	1730	+104	+0.09	573.92	-0.08	1.31	1.42	573.92	Part
	Aug.	2.49	2.39	2.48	2.46	-0.29	-307	2047	1740	-183	1651	-89	4.0	-0.01	+	11	1662	-73	-0.07	4.01	+0.01	1.53	1.67	4.13	Min.
	Sept.	2.20	2.01	2.27	2.08	-0.29	-307	1960	1653	-130	1610	-43	4.0	-0.08	+	85	1695	-42	-0.04	4.08	+0.08	1.81	1.92	4.00	Part
	Oct.	1.91	1.81	2.00	1.91	-0.16	-169	1922	1753	-49	1604	-149	4.0	-0.04	+	42	1646	+86	+0.08	4.04	+0.04	2.04	2.10	4.01	Min.
	Nov.	1.75	1.69	1.96	2.01	-0.15	-159	1944	1785	+106	1859	-26	4.0	-0.22	+	233	2092	-307	-0.26	4.12	+0.12	2.16	1.99	4.00	Part
	Dec.	1.60	1.52	2.04	2.07	0.00	0	1957	1957	+122	1907	-50	3.9	-0.06	+	63	1970	-13	-0.01	3.86	-0.04	1.82	1.80	3.87	Part
1899	Jan.	1.60	1.67	2.06	2.05	-0.04	-42	1953	1911	-44	1913	+2	3.8	-0.15	+	159	2072	-161	-0.14	3.85	+0.05	1.79	1.84	3.89	Part
	Feb.	1.56	1.46	1.82	1.59	+0.08	+85	1854	1939	+64	1975	+36	3.7	-0.01	+	11	1986	-47	-0.04	3.71	+0.01	1.89	1.92	3.51	Part
	Mar.	1.64	1.83	1.72	1.85	+0.34	+360	1908	2268	+338	2277	+9	3.7	+0.13	-	137	2140	+128	+0.11	3.67	-0.03	1.95	1.90	3.75	Part
	April	1.98	2.13	1.94	2.04	+0.30	+317	1952	2269	+179	2447	+178	3.8	+0.12	-	127	2320	-51	-0.04	3.78	-0.02	1.84	1.70	3.74	Part
	May	2.28	2.44	2.18	2.32	+0.22	+233	2015	2248	-88	2181	-67	3.9	+0.26	-	275	1906	+342	+0.29	3.74	-0.16	1.56	1.58	3.90	Part
	June	2.50	2.56	2.43	2.51	-0.08	-85	2058	1973	-129	2119	+146	4.0	-0.03	+	32	2151	-178	-0.15	4.03	+0.03	1.61	1.50	4.01	Part
	July	2.42	2.28	2.48	2.45	-0.24	-254	2045	1791	-186	1787	-4	4.0	+0.12	-	127	1660	+124	+0.12	3.88	-0.12	1.40	1.56	4.01	Min.
	Aug.	2.18	2.09	2.27	2.09	-0.21	-222	1962	1740	-183	1608	-132	4.0	0.00	-	0	1608	+73	+0.07	4.00	0.00	1.73	1.90	3.99	Min.
	Sept.	1.97	1.85	2.00	1.90	-0.24	-254	1920	1666	-130	1610	-56	4.0	-0.07	+	74	1684	-18	-0.02	4.07	+0.07	2.07	2.22	4.12	Part
	Oct.	1.73	1.61	1.69	1.48	-0.11	-116	1829	1713	-49	1617	-96	4.0	-0.05	+	53	1670	+43	+0.04	4.05	+0.05	2.36	2.46	3.94	Part
	Nov.	1.62	1.62	1.52	1.55	-0.14	-148	1845	1697	+106	1819	+122	4.0	-0.19	+	201	2020	-323	-0.27	4.09	+0.09	2.57	2.32	3.87	Part
	Dec.	1.48	1.34	1.76	1.96	-0.13	-137	1933	1796	+122	1819	+23	3.9	-0.02	+	21	1840	-44	-0.04	3.82	-0.08	2.06	2.01	3.97	Part
1900	Jan.	1.35	1.36	1.82	1.67	+0.11	+116	1870	1986	-44	1752	-234	3.8	-0.08	+	85	1837	+149	+0.13	3.78	-0.02	1.96	2.12	3.79	Part
	Feb.	1.46	1.57	1.64	1.61	+0.28	+296	1857	2153	+64	2050	-103	3.7	-0.21	+	222	2272	-119	-0.10	3.91	+0.21	2.27	2.18	3.79	Part
	Mar.	1.74	1.92	1.72	1.82	+0.34	+360	1902	2262	+338	2491	+229	3.7	-0.01	+	11	2502	-115	-0.10	3.81	+0.11	2.09	1.90	3.72	Open
	April	2.08	2.23	1.99	2.16	+0.23	+243	1978	2221	+179	2441	+220	3.8	+0.19	-	201	2240	-19	-0.02	3.71	-0.09	1.72	1.58	3.74	Part
	May	2.31	2.39	2.24	2.33	+0.12	+127	2017	2144	-88	2133	-11	3.9	+0.31	-	328	1805	+339	+0.28	3.69	-0.21	1.45	1.52	3.85	Part
	June	2.43	2.47	2.37	2.41	-0.03	-32	2035	2003	-129	2015	+12	4.0	+0.03	-	32	1983	+20	+0.02	3.97	-0.03	1.60	1.58	3.99	Part
	July	2.40	2.34	2.42	2.43	-0.08	-85	2040	1955	-186	1817	-138	4.0	+0.01	-	11	1806	+149	+0.13	3.99	-0.01	1.57	1.66	4.09	Part
	Aug.	2.32	2.31	2.37	2.31	-0.17	-180	2013	1833	-183	1772	-61	4.0	-0.12	+	127	1899	-66	-0.06	4.12	+0.12	1.75	1.81	4.12	Part
	Sept.	2.15	1.99	2.19	2.07	-0.28	-296	1957	1661	-130	1730	+42	4.0	-0.06	+	63	1766	-105	-0.09	4.06	+0.06	1.87	1.98	4.05	Part
	Oct.	1.87	1.75	1.88	1.68	-0.25	-264	1872	1608	-49	1612	+4	4.0	+0.03	-	32	1580	-59	-0.06	3.97	-0.03	2.09	2.12	3.80	Min.
	Nov.	1.62	1.49	1.76	1.84	-0.15	-159	1906	1747	+106	1714	-33	4.0	-0.01	+	11	1725	+22	+0.02	3.91	-0.09	2.15	2.14	3.98	Part
	Dec.	1.47	1.45	1.80	1.77	-0.07	-74	1891	1817	+122	1869	+52	3.9	-0.13	+	137	2006	-189	-0.16	3.93	+0.03	2.13	2.11	3.88	Part

SESSIONAL PAPER No. 54.

1901	Jan.	1.40	1.35	1.68	1.60	-0.22	-233	1855	1622	-44	1773	+151	3.8	-0.07	+	74	1847	1847	-225	-0.19	3.77	-0.03	2.09	2.18	3.78	Part
	Feb.	1.18	1.00	1.32	1.03	-0.24	-254	1734	1480	+64	1686	+206	3.7	+0.12	-	127	1559	1667	-187	-0.18	3.58	-0.12	2.26	2.37	3.40	Min.
	Mar.	0.94	0.88	0.92	0.82	+0.14	+148	1691	1839	+338	1818	-21	3.7	+0.46	-	423	1395	1667	+172	+0.16	3.40	-0.30	2.48	2.55	3.37	Min.
	April	1.08	1.29	0.94	1.05	+0.22	+323	1739	1972	+179	2018	+46	3.8	+0.34	-	360	1658	1667	+305	+0.29	3.56	-0.24	2.62	2.68	3.73	Min.
	May	1.30	1.31	1.11	1.17	+0.22	+233	1765	1998	-88	1884	-114	3.9	+0.15	-	159	1725	1725	+273	+0.23	3.85	-0.05	2.74	2.70	3.87	Part.
	June	1.52	1.72	1.43	1.69	+0.30	+317	1875	2192	-129	1869	-323	4.0	-0.08	+	85	1954	1954	+238	+0.20	4.08	+0.08	2.65	2.58	4.27	Part.
	July	1.82	1.91	1.78	1.88	+0.02	+21	1915	1936	-186	2006	+70	4.0	-0.28	+	296	2302	2302	-366	-0.31	4.28	+0.28	2.50	2.34	4.22	Part.
	Aug.	1.84	1.78	1.79	1.70	-0.10	-106	1876	1770	-183	1753	-17	4.0	+0.03	-	32	1721	1721	+49	+0.04	3.97	-0.03	2.18	2.24	3.94	Part.
	Sept.	1.74	1.71	1.72	1.75	-0.22	-233	1887	1654	-130	1640	-14	4.0	-0.01	+	11	1651	1667	-13	-0.01	4.01	+0.01	2.29	2.32	4.07	Min.
	Oct.	1.52	1.33	1.64	1.53	-0.28	-296	1840	1544	-49	1605	+61	4.0	0.00	+	0	1605	1667	-123	-0.12	4.00	0.00	2.36	2.39	3.92	Min.
	Nov.	1.24	1.16	1.46	1.39	-0.06	-63	1810	1747	+106	1650	-97	4.0	+0.02	-	21	1629	1667	+80	+0.08	3.88	-0.12	2.42	2.50	3.89	Min.
	Dec.	1.18	1.19	1.38	1.37	-0.04	-42	1806	1764	+122	1869	+105	3.9	-0.16	+	169	2038	2038	-274	-0.23	3.96	+0.06	2.58	2.46	3.83	Part
1902	Jan.	1.14	1.08	1.39	1.41	-0.28	-296	1815	1519	-44	1720	+201	3.8	-0.03	+	32	1752	1752	-233	-0.20	3.73	-0.07	2.34	2.38	3.79	Part
	Feb.	0.86	0.63	1.10	0.79	-0.08	-85	1685	1600	+64	1583	-17	3.7	+0.17	-	180	1403	1667	-67	-0.06	3.53	-0.17	2.43	2.52	3.31	Min.
	Mar.	0.78	0.94	0.87	0.95	+0.44	+465	1718	2183	+338	1938	-245	3.7	+0.33	-	349	1589	1667	+516	+0.49	3.47	-0.23	2.60	2.67	3.62	Min.
	April	1.22	1.49	1.22	1.50	+0.46	+486	1834	2320	+179	2362	+42	3.8	-0.06	+	63	2425	2416	-96	-0.08	3.96	+0.16	2.74	2.50	4.00	Open
	May	1.68	1.86	1.62	1.74	+0.31	+328	1885	2213	-88	2232	+19	3.9	+0.12	-	127	2105	2105	+108	+0.09	3.88	-0.02	2.26	2.16	3.90	Part
	June	1.99	2.12	1.90	2.05	+0.44	+465	1954	2419	-129	2084	-335	4.0	+0.03	-	32	2052	2052	+367	+0.31	3.97	-0.03	2.07	1.98	4.03	Part
	July	2.43	2.74	2.39	2.73	+0.30	+317	2109	2426	-186	2233	-193	4.0	-0.28	+	296	2529	2500	-74	-0.06	4.28	+0.28	1.89	1.72	4.45	Open
	Aug.	2.73	2.72	2.68	2.64	-0.18	-190	2089	1899	-183	2243	+344	4.0	-0.22	+	233	2476	2476	-577	-0.48	4.22	+0.22	1.54	1.40	4.04	Part
	Sept.	2.55	2.38	2.47	2.30	-0.21	-222	2010	1788	-130	1769	-19	4.0	+0.26	-	275	1494	1667	+121	+0.11	3.74	-0.26	1.27	1.39	3.69	Min.
	Oct.	2.34	2.29	2.34	2.39	-0.18	-190	2032	1842	-49	1739	-103	4.0	+0.15	-	159	1580	1667	+175	+0.17	3.85	-0.15	1.51	1.64	4.03	Min.
	Nov.	2.16	2.02	2.26	2.14	-0.24	-254	1974	1720	+106	1948	+228	4.0	-0.12	+	127	2075	2075	-355	-0.30	4.02	+0.02	1.76	1.66	3.80	Part
	Dec	1.92	1.82	2.17	2.20	-0.15	-159	1988	1829	+122	1842	+13	3.9	+0.08	-	85	1757	1757	+72	+0.06	3.72	-0.18	1.55	1.62	3.82	Part
1903	Jan.	1.77	1.72	2.10	1.99	-0.06	-63	1940	1877	-44	1785	-92	3.8	-0.08	+	85	1870	1870	+7	+0.01	3.78	-0.02	1.68	1.82	3.81	Part
	Feb.	1.71	1.70	1.84	1.70	+0.28	+296	1876	2172	+64	1941	-231	3.7	-0.09	+	95	2036	2036	+136	+0.11	3.79	+0.09	1.95	1.96	3.66	Part
	Mar.	1.99	2.28	1.92	2.13	+0.67	+708	1971	2679	+338	2510	-169	3.7	-0.10	+	106	2616	2400	+279	+0.23	3.90	+0.20	1.98	1.82	3.95	Open
	April	2.66	3.05	2.48	2.83	+0.41	+434	2133	2567	+179	2858	+291	3.8	-0.23	+	243	3101	2460	+107	+0.09	4.13	+0.33	1.65	1.52	4.35	Open
	May	3.07	3.09	2.84	2.85	0.00	0	2138	2138	-88	2479	+341	3.9	-0.22	+	233	2712	2484	-346	-0.29	4.22	+0.32	1.38	1.20	4.05	Open
	June	3.07	3.05	2.90	2.95	-0.05	-53	2163	2110	-129	2009	-101	4.0	+0.07	-	74	1935	1935	+175	+0.15	3.93	-0.07	1.03	1.07	4.02	Part
	July	3.02	2.98	2.97	2.99	-0.15	-159	2173	2014	-186	1924	-90	4.0	-0.08	+	85	2009	2009	+5	0.00	4.08	+0.08	1.11	1.18	4.17	Part
	Aug.	2.87	2.76	2.82	2.64	-0.19	-201	2089	1888	-183	1831	-57	4.0	-0.08	+	85	1916	1916	-28	-0.02	4.08	+0.08	1.26	1.36	4.00	Part
	Sept.	2.68	2.59	2.60	2.55	-0.26	-275	2067	1792	-130	1758	-34	4.0	-0.06	+	63	1821	1821	-29	-0.02	4.06	+0.06	1.46	1.52	4.07	Part
	Oct.	2.42	2.25	2.46	2.36	-0.41	-431	2024	1590	-49	1743	+153	4.0	-0.04	+	42	1785	1785	-195	-0.16	4.04	+0.04	1.58	1.64	4.00	Part
	Nov.	2.01	1.77	2.18	2.01	-0.47	-497	1945	1448	+106	1696	+248	4.0	+0.02	-	21	1675	1675	-227	-0.19	3.88	-0.12	1.70	1.68	3.69	Part
	Dec.	1.54	1.31	2.02	2.02	-0.29	-307	1947	1640	+122	1570	-70	3.9	+0.11	-	116	1454	1667	-27	-0.03	3.69	-0.21	1.69	1.90	3.92	Min.
1904	Jan.	1.25	1.19	1.54	1.06	-0.01	-11	1741	1730	-44	1596	-134	3.8	+0.04	-	42	1554	1667	+63	+0.06	3.66	-0.14	2.12	2.33	3.39	Min.
	Feb.	1.24	1.28	1.18	1.30	+0.33	+349	1792	2141	+64	1794	-347	3.7	-0.02	+	21	1816	1816	+325	+0.27	3.72	+0.02	2.54	2.48	3.78	Part
	Mar.	1.57	1.86	1.58	1.86	+0.81	+857	1910	2767	+338	2479	-288	3.7	-0.19	+	201	2680	2423	+344	+0.29	3.99	+0.29	2.41	2.16	4.02	Open
	April	2.38	2.91	2.38	2.89	+0.66	+698	2149	2847	+179	2946	+99	3.8	-0.38	+	402	3348	2500	+347	+0.29	4.28	+0.48	1.90	1.70	4.59	Open
	May	3.04	3.17	3.06	3.23	+0.20	+211	2231	2442	-88	2759	+317	3.9	-0.57	+	603	3362	2579	-137	-0.12	4.57	+0.67	1.51	1.30	4.53	Open
	June	3.24	3.32	3.36	3.49	+0.12	+127	2296	2423	-129	2313	-110	4.0	-0.45	+	476	2789	2546	-123	-0.10	4.45	+0.45	1.09	1.00	4.49	Open

a.—The flow of 1000 c.f.s. through the Erie Canal and that of 1100 c.f.s. through the Welland Canal have been omitted.

SESSIONAL PAPER No. 54.

1873	571	21.571	16.571	52.571	41	-0.05	-	53	1814	1761	-44	1640	-121	573.8	-0.10	+	106	1746	1746	1746	+15	+0.01	573.80	0.00	2.28	2.40	573.81	Part
Jan.	1 16	1 17	1 30	1 20	+0.04	+	42	1771	1813	+64	+	1825	+12	3.7	-0.11	+	116	1941	1941	1941	-128	-0.11	3.81	+0.11	2.51	2.50	3.70	Part
Feb.	1 20	1 24	1 21	1 22	+0.68	+	719	1775	2494	+338	+	2151	-343	3.7	+0.10	-	106	2045	2045	2045	+449	+0.38	3.70	0.00	2.49	2.38	3.60	Part
Mar.	1 88	2 52	1 82	2 43	+0.98	+	1036	2040	3076	+179	+	2673	-403	3.8	-0.18	+	190	2863	2447	2447	+629	+0.53	4.08	+0.28	2.26	2.06	4.49	Open
April	2 86	3 19	2 76	3 09	+0.37	+	391	2196	2587	-88	-	2988	+401	3.9	-0.61	+	645	3633	2590	2590	-3	0.00	4.61	+0.71	1.85	1.65	4.74	Open
May	3 23	3 27	3 16	3 24	+0.03	+	32	2234	2266	-129	-	2458	+192	4.0	-0.61	+	645	3103	2590	2590	-324	-0.27	4.61	+0.61	1.45	1.26	4.50	Open
June	3 26	3 25	3 26	3 29	-0.04	-	42	2246	2204	-186	-	2080	-124	4.0	-0.34	+	360	2440	2440	2440	-236	-0.20	4.34	+0.34	1.08	1.00	4.29	Part
July	3 22	3 19	3 22	3 15	-0.23	-	243	2210	1967	-183	-	2021	+54	4.0	-0.14	+	148	2169	2169	2169	-202	-0.17	4.14	+0.14	0.92	0.96	4.11	Part
Aug.	2 99	2 79	2 98	2 81	-0.35	-	370	2129	1759	-130	-	1837	+78	4.0	+0.03	-	32	1805	1805	1805	-46	-0.04	3.97	-0.03	0.99	1.12	3.93	Part
Sept.	2 64	2 49	2 69	2 57	-0.25	-	264	2073	1809	-49	-	1710	-99	4.0	+0.07	-	74	1636	1667	1667	+142	+0.13	3.93	-0.07	1.24	1.39	3.96	Min.
Oct.	2 39	2 29	2 52	2 48	+0.09	+	95	2051	2146	+106	+	1915	-231	4.0	-0.16	+	169	2084	2084	2084	+62	+0.05	4.06	+0.06	1.54	1.44	3.92	Part
Nov.	2 48	2 66	2 76	3 04	+0.38	+	402	2185	2587	+122	+	2268	-319	3.9	-0.31	+	328	2596	2455	2455	+142	+0.11	4.11	+0.21	1.35			Open
Dec.	572	38.572	36.572	70.572	61	+0.26	+	275	2081	2356	-44	2173	-183	573.8	-0.10	+	106	2279	2279	2279	+77	+0.06	573.80	0.00	1.10	1.09	573.70	Part
Jan.	2 64	2 92	2 78	2 95	+0.60	+	634	2162	2796	+64	+	2420	-376	3.7	-0.16	+	169	2589	2390	2390	+406	+0.34	3.86	+0.16	1.08	1.02	3.97	Open
Feb.	3 24	3 57	3 25	3 55	+0.59	+	624	2311	2935	+338	+	3134	+199	3.7	-0.40	+	423	3557	2479	2479	+456	+0.38	4.20	+0.50	0.95	0.88	4.43	Open
Mar.	3 83	4 09	3 78	4 00	+0.42	+	444	2425	2869	+179	+	3114	+245	3.8	-0.68	+	719	3833	2582	2582	+287	+0.24	4.58	+0.78	0.80	0.73	4.73	Open
April	4 25	4 41	4 16	4 31	+0.21	+	222	2507	2729	-88	-	2781	+52	3.9	-0.82	+	867	3648	2648	2648	+81	+0.07	4.82	+0.92	0.66	0.58	4.89	Open
May	4 46	4 52	4 40	4 49	0.00		0	2557	2557	-129	-	2600	+43	4.0	-0.89	+	941	3541	2667	2667	-110	-0.09	4.89	+0.89	0.49	0.41	4.90	Open
June	4 46	4 41	4 47	4 45	-0.20	-	211	2546	2335	-186	-	2371	+36	4.0	-0.80	+	846	3217	2642	2642	-307	-0.26	4.80	+0.80	0.33	0.30	4.75	Open
July	4 26	4 11	4 26	4 07	-0.24	-	254	2444	2190	-183	-	2152	-38	4.0	-0.54	+	571	2723	2571	2571	-381	-0.32	4.54	+0.54	0.28	0.24	4.31	Open
Aug.	4 02	3 94	4 02	3 96	-0.34	-	360	2414	2054	-130	-	2060	+6	4.0	-0.22	+	233	2293	2293	2293	-239	-0.20	4.22	+0.22	0.20	0.25	4.21	Part
Sept.	3 68	3 41	3 72	3 49	-0.23	-	243	2296	2053	-49	-	2005	-48	4.0	-0.02	+	21	2026	2026	2026	+27	+0.02	4.02	+0.02	0.30	0.38	3.87	Part
Oct.	3 45	3 49	3 58	3 68	-0.13	-	137	2344	2207	+106	+	2159	-48	4.0	-0.14	+	148	2307	2307	2307	-100	-0.08	4.04	+0.04	0.46	0.41	4.09	Part
Nov.	3 32	3 15	3 60	3 53	-0.37	-	391	2306	1915	+122	+	2329	+414	3.9	-0.16	+	169	2498	2416	2416	-501	-0.42	3.96	+0.06	0.36			Open
Dec.	1876																											

a.—The flow of 1000 c.f.s. through the Erie Canal, and that of 1100 c.f.s. through the Welland Canal have been omitted.

TABLE 35. REGULATION OF LAKE ERIE BETWEEN STAGES 572.0 AND 574.5.

DATE	WATER LEVELS OF LAKE ERIE.				STORAGE IN LAKE ERIE		OUTFLOW THROUGH NIAGARA RIVER, 100 c.f.s. a	TOTAL SUPPLY TO LAKE ERIE, 100 c.f.s. a	EXPECTED CHANGE IN TOTAL SUPPLY OVER PRECEDING MONTH, 100 c.f.s.	EXPECTED TOTAL SUPPLY FOR MONTH, 100 c.f.s.	EXPECTED TOTAL SUPPLY MINUS TOTAL SUPPLY, 100 c.f.s.	REGULATED LAKE LEVEL DESIRED, BUFFALO, N.Y. First of Month.	CHANGE IN STAGE REQUIRED BY LAST OF MONTH Foot Depth.	CHANGE IN OUTFLOW TO PRECEDING COLUMN, 100 c.f.s.	EXPECTED REGULATED OUTFLOW FOR MONTH, 100 c.f.s.	REGULATED OUTFLOW FOR FIRST OF MONTH, 100 c.f.s.	REGULATED STORAGE IN LAKE ERIE.		REGULATED LAKE LEVEL, BUFFALO, N.Y. First of Month.	REGULATED LEVEL MINUS First of Month.	REGULATED LAKE LEVEL, MINUS ACTUAL LAKE LEVEL, BUFFALO, N.Y.		REGULATED LAKE LEVEL, BUFFALO, N.Y. Mean of Month.	SLUICE GATES.	
	CLEVELAND, O. BUFFALO, N.Y.		100 c.f.s.	Foot Depth																					
	First of Month	Mean of Month																							
					First of Month	Mean of Month																			
1876	572.38	572.36	572.70	572.61			+0.26	+275	2081	2356	-44	2173	-183	572.3	-0.10	+106	2279	2010	+346	+0.29	572.30	0.00	-0.40	-0.30	572.31
Jan.	2.61	2.92	2.78	2.95	+0.60	+634	2162	2796	+64	2420	-376	2.2	-0.39	+412	2832	2077	+719	+0.60	+0.60	2.59	+0.39	-0.19	-0.12	2.83	Open
Feb.	3.24	3.57	3.25	3.55	+0.59	+624	2311	2935	+338	3134	+199	2.2	-0.99	+1047	4181	2221	+714	+0.60	+0.60	3.19	+0.99	-0.06	-0.02	3.53	Open
Mar.	3.83	4.09	3.78	4.00	+0.42	+444	2425	2869	+179	3114	+245	2.2	-1.49	+1576	4690	2372	+497	+0.42	+0.42	3.79	+1.59	+0.01	+0.03	4.03	Open
April	4.25	4.41	4.16	4.31	+0.21	+222	2507	2729	-88	2781	+52	2.3	-1.81	+1914	4695	2482	+247	+0.21	+0.21	4.21	+1.91	+0.05	+0.04	4.35	Open
May	4.46	4.52	4.40	4.49	0.00	0	2557	2557	-129	2600	+43	2.4	-1.92	+2030	4630	2538	+19	+0.02	+0.02	4.42	+2.02	+0.02	0.00	4.49	Open
June	4.46	4.41	4.47	4.45	-0.20	-211	2546	2335	-186	2371	+36	2.5	-1.94	+2051	4422	2543	-208	-0.17	-0.17	4.44	+1.94	-0.03	-0.01	4.44	Open
July	4.26	4.11	4.26	4.07	-0.24	-254	2444	2190	-183	2152	-38	2.5	-1.77	+1872	4024	2497	-307	-0.26	-0.26	4.27	+1.77	+0.01	0.00	4.07	Open
Aug.	4.02	3.94	4.02	3.96	-0.34	-360	2414	2054	-130	2060	+6	2.5	-1.51	+1597	3657	2429	-375	-0.32	-0.32	4.01	+1.51	-0.01	-0.02	3.94	Open
Sept.	3.68	3.41	3.72	3.49	-0.23	-243	2296	2053	-49	2005	-48	2.5	-1.19	+1258	3263	2346	-293	-0.25	-0.25	3.69	+1.19	-0.03	-0.08	3.41	Open
Oct.	3.45	3.49	3.58	3.68	-0.13	-137	2344	2207	+106	2159	-48	2.5	-1.04	+1100	3259	2283	-76	-0.06	-0.06	3.44	+0.94	-0.14	-0.18	3.50	Open
Nov.	3.32	3.15	3.60	3.53	-0.37	-391	2306	1915	+122	2329	+414	2.4	-1.08	+1142	3471	2268	-353	-0.30	-0.30	3.38	+0.98	-0.22	-0.20	3.33	Open
Dec.	571.40	571.23	571.76	571.69	-0.28	-296	1875	1579	-44	1647	+68	572.3	-0.10	+106	1753	1753	-174	-0.15	-0.15	572.30	0.00	+0.54	+0.68	572.37	Part
1895	Jan.	1.12	1.00	1.34	1.00	-0.12	-127	1728	1601	+64	1643	+42	2.2	+0.05	-53	1590	1667	-66	-0.06	2.15	-0.05	+0.81	+0.97	1.97	Min.
Feb.	1.00	1.01	0.96	0.92	+0.14	+148	1712	1860	+338	1939	+79	2.2	+0.11	-116	1823	1823	+37	+0.03	2.09	-0.11	+1.13	+1.12	2.04	Part	
Mar.	1.14	1.26	1.02	1.13	+0.23	+243	1756	1999	+179	2039	+40	2.2	+0.18	-190	1849	1849	+150	+0.13	2.12	-0.08	+1.10	+1.02	2.15	Part	
April	1.37	1.48	1.30	1.48	+0.15	+159	1829	1988	-88	1911	-77	2.3	+0.15	-159	1752	1752	+236	+0.20	2.25	-0.05	+0.95	+0.94	2.42	Part	
May	1.52	1.57	1.53	1.58	0.00	0	1851	1851	-129	1859	+8	2.4	+0.05	-53	1806	1806	+45	+0.04	2.45	+0.05	+0.92	+0.92	2.50	Part	
June	1.52	1.46	1.57	1.56	-0.10	-106	1846	1740	-186	1665	-75	2.5	+0.01	+11	1654	1667	+73	+0.07	2.49	-0.01	+0.92	+1.00	2.56	Min.	
July	1.42	1.38	1.49	1.42	-0.09	-95	1817	1722	-183	1557	-165	2.5	-0.06	+63	1620	1667	+55	+0.05	2.56	+0.06	+1.07	+1.12	2.51	Min.	
Aug.	1.33	1.28	1.43	1.44	-0.29	-307	1821	1514	-130	1592	+78	2.5	-0.11	+116	1708	1708	-194	-0.16	2.61	+0.11	+1.18	+1.16	2.60	Part	
Sept.	1.04	0.80	1.32	1.20	-0.29	-307	1771	1464	-49	1465	+1	2.5	+0.05	-53	1412	1667	-203	-0.19	2.45	-0.05	+1.13	+1.22	2.42	Min.	
Oct.	0.75	0.70	0.96	0.71	+0.03	+32	1670	1702	+106	1570	-132	2.5	+0.14	-148	1422	1667	+35	+0.03	2.26	-0.24	+1.30	+1.38	2.09	Min.	
Nov.	0.78	0.86	0.84	0.97	+0.13	+137	1723	1860	+122	1824	-36	2.4	+0.01	-11	1813	1813	+47	+0.04	2.29	-0.11	+1.45	+1.37	2.34	Part	

a.—The flow of 1000 c.f.s. through the Erie Canal and that of 1100 c.f.s. through the Welland Canal have been omitted.

TABLE 36.

EFFECT OF REGULATION OF LAKE ERIE.
BETWEEN STAGES 572.0 AND 574.5, ON WATER LEVELS OF LAKE ONTARIO.

DATE	WATER LEVELS OF LAKE ONTARIO AT CHARLOTTE, N. Y.		ACTUAL RISE OR FALL DURING MONTH, In Feet.	INFLOW FROM NIAGARA RIVER, <i>a</i>		CHANGE IN INFLOW TO LAKE ONTARIO THROUGH REGULA- TION OF LAKE ERIE 100 c.f.s.	EFFECT OF CHANGE OF INFLOW ON LEVEL OF LAKE ONTARIO, FOR MONTH, In Feet.	EFFECT OF CHANGE OF OUTFLOW THROUGH ST. LAWRENCE RIVER ON LEVEL OF LAKE ONTARIO, In Feet.	TOTAL EFFECT FROM CHANGE OF INFLOW AND OUTFLOW ON LEVEL OF LAKE ONTARIO, In Feet.	REGULATED CONDITIONS.		REGULATED LEVEL LESS ACTUAL LEVEL.		WATER LEVELS OF LAKE ONTARIO REGU- LATED CONDI- TIONS, Mean of Month.
	First of Month	Mean of Month.		ACTUAL CONDI- TIONS, 100 c.f.s.	REGULATED CONDI- TIONS, 100 c.f.s.					RISE OR FALL DURING MONTH, In Feet.	STAGE OF LAKE ONTARIO, First of Month.	First of Month.	Mean of Month.	
1876														
Jan.	245.28	245.48	+0.52	2081	2049	- 32	-0.035	0.000	-0.035	+0.485	245.280	0.000	-0.018	245.46
Feb.	5.80	6.11	+0.60	2162	2157	- 5	-0.006	+0.011	+0.005	+0.605	5.765	-0.035	-0.032	6.08
Mar.	6.40	6.70	+0.76	2311	2301	- 10	-0.011	+0.010	-0.001	+0.759	6.370	-0.030	-0.030	6.67
April	7.16	7.62	+0.80	2425	2428	+ 3	+0.003	+0.010	+0.013	+0.813	7.129	-0.031	-0.024	7.60
May	7.96	8.30	+0.40	2507	2510	+ 3	+0.003	+0.006	+0.009	+0.409	7.942	-0.018	-0.014	8.29
June	8.36	8.42	+0.07	2557	2541	- 16	-0.017	+0.003	-0.014	+0.056	8.351	-0.009	-0.016	8.40
July	8.43	8.44	-0.20	2516	2520	- 26	-0.028	+0.008	-0.020	-0.220	8.407	-0.023	-0.033	8.41
Aug.	8.23	8.02	-0.55	2444	2462	+ 18	+0.020	+0.014	+0.034	-0.516	8.187	-0.043	-0.026	7.99
Sept.	7.68	7.35	-0.50	2414	2386	- 28	-0.031	+0.003	-0.028	-0.528	7.671	-0.009	-0.023	7.33
Oct.	7.18	7.00	-0.35	2296	2313	+ 17	+0.019	+0.012	+0.031	-0.319	7.143	-0.037	-0.022	6.98
Nov.	6.83	6.66	-0.31	2344	2275	- 69	-0.076	+0.002	-0.074	-0.384	6.824	-0.006	-0.043	6.62
Dec.	6.52	6.39	-0.34	2306	2228	- 78	-0.085	+0.025	-0.060	-0.400	6.440	-0.080	-0.110	6.28
1895														
Jan.	244.54	244.55	-0.07	1875	1733	-142	-0.157	0.000	-0.157	-0.227	244.540	0.000	-0.078	244.47
Feb.	4.47	4.39	-0.07	1728	1667	- 61	-0.068	+0.047	-0.021	-0.091	4.313	-0.157	-0.168	4.22
Mar.	4.40	4.40	+0.17	1712	1827	+115	+0.127	+0.053	+0.180	+0.350	4.222	-0.178	-0.088	4.31
April	4.57	4.74	+0.28	1756	1866	+110	+0.122	-0.001	+0.121	+0.401	4.572	+0.002	+0.062	4.80
May	4.85	4.96	+0.03	1829	1779	- 50	-0.055	-0.037	-0.092	-0.062	4.973	+0.123	+0.077	5.04
June	4.88	4.79	-0.22	1851	1811	- 40	-0.044	-0.009	-0.053	-0.273	4.911	+0.031	+0.004	4.79
July	4.66	4.53	-0.26	1846	1667	-179	-0.198	+0.007	-0.191	-0.451	4.638	-0.022	-0.118	4.41
Aug.	4.40	4.26	-0.25	1817	1667	-150	-0.166	+0.064	-0.102	-0.352	4.187	-0.213	-0.264	4.00
Sept.	4.15	4.04	-0.31	1821	1687	-134	-0.149	+0.091	-0.058	-0.368	3.835	-0.315	-0.344	3.70
Oct.	3.84	3.64	-0.32	1771	1667	-104	-0.116	+0.108	-0.008	-0.328	3.467	-0.373	-0.377	3.26
Nov.	3.52	3.41	-0.06	1670	1667	- 3	-0.003	+0.110	+0.107	+0.047	3.139	-0.381	-0.328	3.08
Dec.	3.46	3.51	+0.18	1723	1818	+ 95	+0.106	+0.079	+0.185	+0.365	3.186	-0.274	-0.182	3.33

a.—The flow of 1000 c.f.s. through the Erie Canal and that of 1100 c.f.s. through the Welland Canal have been omitted.

TABLE 38.
REGULATION OF LAKE SUPERIOR TO COMPENSATE FOR DIVERSION OF 4000
CUBIC FEET PER SECOND THROUGH THE CHICAGO DRAINAGE CANAL.

DATE	WATER LEVELS OF ST. MARYS RIVER AT SAULT STE. MARIE, MICH.			TOTAL SUPPLY TO LAKE SUPERIOR 100 c.f.s.	ASSUMED CON- STANT OUTFLOW THROUGH ST. MARYS RIVER, 100 c.f.s.	TOTAL SUPPLY LESS CONSTANT OUTFLOW, 100 c.f.s.	EFFECT OF CHANGE OF OUTFLOW ON STAGE OF LAKE SUPERIOR FOR MONTH, In Feet.	REGULATED LEVEL LESS ACTUAL LEVEL AT SAULT STE. MARIE, MICH.		WATER LEVELS OF ST. MARYS RIVER AT SAULT STE. MARIE REGULAT- ED CON- DITIONS Mean of Month.
	Actual Conditions.		Regulated Conditions First of Month.					First of Month.	Mean of Month.	
	First of Month.	Mean of Month.								
1888										
May		601.43								
June	601.855	2.28	601.855	2606	697	+1909	+0.543	0.000	+0.019	602.299
July	2.36	2.44	2.398	1553	697	+ 856	+0.243	+0.038	+0.122	2.562
Aug.	2.435	2.43	2.641	1143	697	+ 446	+0.127	+0.206	+0.292	2.722
Sept.	2.39	2.35	2.768	734	697	+ 37	+0.011	+0.378	+0.406	2.756
Oct.	2.345	2.34	2.779	578	697	- 119	-0.034	+0.434	+0.470	2.810
Nov.	2.24	2.14	2.745	90	697	- 607	-0.173	+0.505	+0.554	2.694
Dec.	1.97	1.80	2.572	- 361	697	-1058	-0.301	+0.602	+0.606	2.406
1889										
Jan.	1.66	1.52	2.271	- 196	697	- 893	-0.254	+0.611	+0.626	2.146
Feb.	1.375	1.23	2.017	1	697	- 696	-0.198	+0.642	+0.608	1.838
Mar.	1.245	1.26	1.819	398	697	- 299	-0.085	+0.574	+0.526	1.788
April	1.255	1.25	1.734	1280	697	+ 583	+0.166	+0.479	+0.427	1.677
May	1.525	1.81	1.900	1579	697	+ 882	+0.251	+0.375	+0.313	2.123
June	1.90	1.99	2.151	1343	697	+ 646	+0.184	+0.251	+0.230	2.290
July	2.125	2.26	2.335	1516	697	+ 819	+0.233	+0.210	+0.256	2.516
Aug.	2.265	2.27	2.568	1416	697	+ 719	+0.204	+0.303	+0.405	2.675
Sept.	2.265	2.26	2.772	819	697	+ 122	+0.035	+0.507	+0.564	2.824
Oct.	2.185	2.11	2.807	41	697	- 656	-0.187	+0.622	+0.641	2.751
Nov.	1.96	1.81	2.620	- 257	697	- 954	-0.271	+0.660	+0.694	2.504
Dec.	1.62	1.43	2.349	- 44	697	- 741	-0.211	+0.729	+0.706	2.136
1890										
Jan.	1.455	1.48	2.138	255	697	- 442	-0.126	+0.683	+0.745	2.225
Feb.	1.205	0.93	2.012	- 25	697	- 722	-0.205	+0.807	+0.844	1.774
Mar.	0.925	0.92	1.807	143	697	- 554	-0.158	+0.882	+0.823	1.743
April	0.885	0.85	1.649	894	697	+ 197	+0.056	+0.764	+0.692	1.542
May	1.085	1.32	1.705	1804	697	+1107	+0.315	+0.620	+0.515	1.835
June	1.61	1.90	2.020	2073	697	+1376	+0.391	+0.410	+0.370	2.270
July	2.08	2.26	2.411	1635	697	+ 938	+0.267	+0.331	+0.397	2.657
Aug.	2.215	2.17	2.678	1328	697	+ 631	+0.179	+0.463	+0.602	2.772
Sept.	2.115	2.06	2.857	1000	697	+ 303	+0.086	+0.742	+0.830	2.890
Oct.	2.025	1.99	2.943	408	697	- 289	-0.082	+0.918	+0.930	2.920
Nov.	1.92	1.85	2.861	- 181	697	- 878	-0.250	+0.941	+0.926	2.776
Dec.	1.70	1.55	2.610	- 496	697	-1193	-0.339	+0.910	+0.988	2.538
1891										
Jan.	1.205	0.86	2.271	- 243	697	- 940	-0.267	+1.066	+1.078	1.938
Feb.	0.915	0.97	2.004	323	697	- 374	-0.106	+1.089	+1.046	2.016
Mar.	0.895	0.82	1.898	446	697	- 251	-0.071	+1.003	+0.960	1.780
April	0.91	1.00	1.827	890	697	+ 193	+0.055	+0.917	+0.792	1.792
May	1.215	1.43	1.882	1129	697	+ 432	+0.123	+0.667	+0.634	2.064
June	1.405	1.38	2.005	1119	697	+ 422	+0.120	+0.600	+0.645	2.025
July	1.435	1.49	2.125	1022	697	+ 325	+0.092	+0.690	+0.706	2.196
Aug.	1.495	1.50	2.217	616	697	- 81	-0.023	+0.722	+0.726	2.226
Sept.	1.465	1.43	2.194	789	697	+ 92	+0.026	+0.729	+0.744	2.174
Oct.	1.46	1.49	2.220	665	697	- 32	-0.009	+0.760	+0.768	2.258
Nov.	1.435	1.38	2.211	- 139	697	- 836	-0.238	+0.776	+0.762	2.142
Dec.	1.225	1.07	1.973	3	697	- 694	-0.197	+0.748	+0.760	1.830
1892										
Jan.	1.04	1.01	1.776	144	697	- 553	-0.157	+0.772	+0.780	1.790
Feb.	0.83	0.65	1.619	- 149	697	- 846	-0.241	+0.789	+0.804	1.454
Mar.	0.56	0.47	1.378	308	697	- 389	-0.111	+0.818	+0.768	1.238
April	0.55	0.63	1.267	1122	697	+ 425	+0.121	+0.717	+0.610	1.240
May	0.885	1.14	1.388	1853	697	+1156	+0.329	+0.503	+0.450	1.590
June	1.32	1.50	1.717	1415	697	+ 718	+0.204	+0.397	+0.374	1.874
July	1.57	1.64	1.921	1001	697	+ 304	+0.086	+0.351	+0.356	1.996
Aug.	1.645	1.65	2.007	1037	697	+ 340	+0.097	+0.362	+0.393	2.043
Sept.	1.68	1.71	2.104	675	697	- 22	-0.006	+0.424	+0.434	2.144
Oct.	1.655	1.60	2.098	279	697	- 418	-0.119	+0.443	+0.481	2.081
Nov.	1.46	1.32	1.979	- 83	697	- 780	-0.222	+0.519	+0.548	1.868
Dec.	1.18	1.04	1.757	- 326	697	-1023	-0.291	+0.577	+0.564	1.604
1893										
Jan.	0.915	0.79	1.466	- 110	697	- 807	-0.230	+0.551	+0.548	1.338
Feb.	0.69	0.59	1.236	414	697	- 283	-0.080	+0.546	+0.554	1.144
Mar.	0.595	0.60	1.156	739	697	+ 42	+0.012	+0.561	+0.502	1.102
April	0.725	0.85	1.168	1551	697	+ 854	+0.243	+0.443	+0.360	1.210
May	1.135	1.42	1.411	2372	697	+1675	+0.476	+0.276	+0.239	1.659
June	1.685	1.95	1.887	2132	697	+1435	+0.408	+0.202	+0.224	2.174
July	2.05	2.15	2.295	1387	697	+ 690	+0.196	+0.245	+0.273	2.423
Aug.	2.19	2.23	2.491	739	697	+ 42	+0.012	+0.301		
Sept.	2.165	2.10	2.503							

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TABLE 39.

REGULATION OF LAKE SUPERIOR TO COMPENSATE FOR DIVERSION OF 14000 CUBIC FEET PER SECOND THROUGH THE CHICAGO DRAINAGE CANAL.

DATE	WATER LEVELS OF ST. MARYS RIVER AT SAULT STE. MARIE, MICH.			TOTAL SUPPLY TO LAKE SUPERIOR 100 c.f.s.	ASSUMED CON- STANT OUTFLOW THROUGH ST. MARYS RIVER, 100 c.f.s.	TOTAL SUPPLY LESS CONSTANT OUTFLOW, 100 c.f.s.	EFFECT OF CHANGE OF OUTFLOW ON STAGE OF LAKE SUPERIOR FOR MONTH, In Feet.	REGULATED LEVEL LESS ACTUAL LEVEL AT SAULT STE. MARIE, MICH.		WATER LEVELS OF ST. MARYS RIVER AT SAULT STE. MARIE REGULAT- ED CON- DITIONS Mean of Month.
	Actual Conditions.		Regulated Conditions First of Month.					First of Month.	Mean of Month.	
	First of Month.	Mean of Month.								
1888										
May		601.43								
June	601.855	2.28	601.855	2606	797	+1809	+0.514	0.000	+0.004	602.284
July	2.36	2.44	2.369	1553	797	+ 756	+0.215	+0.009	+0.079	2.519
Aug.	2.435	2.43	2.584	1143	797	+ 346	+0.098	+0.149	+0.220	2.650
Sept.	2.39	2.35	2.682	734	797	- 63	-0.018	+0.292	+0.306	2.656
Oct.	2.345	2.34	2.664	578	797	- 219	-0.062	+0.319	+0.340	2.680
Nov.	2.24	2.14	2.602	90	797	- 707	-0.201	+0.362	+0.396	2.536
Dec.	1.97	1.80	2.401	- 361	797	-1158	-0.329	+0.431	+0.422	2.222
1889										
Jan.	1.66	1.52	2.072	- 196	797	- 993	-0.282	+0.412	+0.414	1.934
Feb.	1.375	1.23	1.790	1	797	- 796	-0.226	+0.415	+0.367	1.597
Mar.	1.245	1.26	1.564	398	797	- 399	-0.113	+0.319	+0.258	1.518
April	1.255	1.25	1.451	1280	797	+ 483	+0.137	+0.196	+0.130	1.380
May	1.525	1.81	1.588	1579	797	+ 782	+0.222	+0.063	-0.014	1.796
June	1.90	1.99	1.810	1343	797	+ 546	+0.155	-0.090	-0.125	1.865
July	2.125	2.26	1.965	1516	797	+ 719	+0.204	-0.160	-0.128	2.132
Aug.	2.265	2.27	2.169	1416	797	+ 619	+0.176	-0.096	-0.008	2.262
Sept.	2.265	2.26	2.345	819	797	+ 22	+0.006	+0.080	+0.123	2.383
Oct.	2.185	2.11	2.351	41	797	- 756	-0.215	+0.166	+0.171	2.281
Nov.	1.96	1.81	2.136	- 257	797	-1054	-0.300	+0.176	+0.196	2.006
Dec.	1.62	1.43	1.836	- 44	797	- 841	-0.239	+0.216	+0.179	1.609
1890										
Jan.	1.455	1.48	1.597	255	797	- 542	-0.154	+0.142	+0.190	1.670
Feb.	1.205	0.93	1.443	- 25	797	- 822	-0.234	+0.238	+0.261	1.191
Mar.	0.925	0.92	1.209	143	797	- 654	-0.186	+0.284	+0.211	1.131
April	0.885	0.85	1.023	894	797	+ 97	+0.028	+0.138	+0.052	0.902
May	1.085	1.32	1.051	1804	797	+1007	+0.286	-0.034	-0.154	1.166
June	1.61	1.90	1.337	2073	797	+1276	+0.363	-0.273	-0.326	1.574
July	2.08	2.26	1.700	1635	797	+ 838	+0.238	-0.380	-0.328	1.932
Aug.	2.215	2.17	1.938	1328	797	+ 531	+0.151	-0.277	-0.152	2.018
Sept.	2.115	2.06	2.089	1000	797	+ 203	+0.058	-0.026	+0.048	2.108
Oct.	2.025	1.99	2.147	408	797	- 389	-0.111	+0.122	+0.119	2.109
Nov.	1.92	1.85	2.036	- 181	797	- 978	-0.278	+0.116	+0.087	1.937
Dec.	1.70	1.55	1.758	- 496	797	-1293	-0.368	+0.058	+0.122	1.672
1891										
Jan.	1.205	0.86	1.390	- 243	797	-1040	-0.296	+0.185	+0.182	1.042
Feb.	0.915	0.97	1.094	323	797	- 474	-0.135	+0.179	+0.122	1.092
Mar.	0.895	0.82	0.959	446	797	- 351	-0.100	+0.064	+0.006	0.826
April	0.91	1.00	0.859	890	797	+ 93	+0.026	-0.051	-0.190	0.810
May	1.215	1.43	0.885	1129	797	+ 332	+0.094	-0.330	-0.378	1.052
June	1.405	1.38	0.979	1119	797	+ 322	+0.092	-0.426	-0.395	0.985
July	1.435	1.49	1.071	1022	797	+ 225	+0.064	-0.364	-0.362	1.128
Aug.	1.495	1.50	1.135	616	797	- 181	-0.051	-0.360	-0.370	1.130
Sept.	1.465	1.43	1.084	789	797	- 8	-0.002	-0.381	-0.380	1.050
Oct.	1.46	1.49	1.082	665	797	- 132	-0.038	-0.378	-0.384	1.106
Nov.	1.435	1.38	1.044	- 139	797	- 936	-0.266	-0.391	-0.419	0.961
Dec.	1.225	1.07	0.778	3	797	- 794	-0.226	-0.447	-0.472	0.598
1892										
Jan.	1.04	1.01	0.552	144	797	- 653	-0.186	-0.498	-0.481	0.529
Feb.	0.83	0.65	0.366	- 149	797	- 946	-0.269	-0.464	-0.464	0.186
Mar.	0.56	0.47	0.097	308	797	- 489	-0.139	-0.463	-0.528	599.942
April	0.55	0.63	599.958	1122	797	+ 325	+0.092	-0.592	-0.714	9.916
May	0.885	1.14	600.050	1853	797	+1056	+0.300	-0.835	-0.902	600.238
June	1.32	1.50	0.350	1415	797	+ 618	+0.176	-0.970	-1.007	0.493
July	1.57	1.64	0.526	1001	797	+ 204	+0.058	-1.044	-1.052	0.588
Aug.	1.645	1.65	0.584	1037	797	+ 240	+0.068	-1.061	-1.044	0.606
Sept.	1.68	1.71	0.652	675	797	- 122	-0.035	-1.028	-1.033	0.677
Oct.	1.655	1.60	0.617	279	797	- 518	-0.147	-1.038	-1.014	0.586
Nov.	1.46	1.32	0.470	- 83	797	- 880	-0.250	-0.990	-0.975	0.345
Dec.	1.18	1.04	0.220	- 326	797	-1123	-0.319	-0.960	-0.987	0.053
1893										
Jan.	0.915	0.79	599.901	- 110	797	- 907	-0.258	-1.014	-1.030	599.760
Feb.	0.69	0.59	9.643	414	797	- 383	-0.109	-1.047	-1.054	9.536
Mar.	0.595	0.60	9.534	739	797	- 58	-0.016	-1.061	-1.134	9.466
April	0.725	0.85	9.518	1551	797	+ 754	+0.214	-1.207	-1.305	9.545
May	1.135	1.42	9.732	2372	797	+1575	+0.448	-1.403	-1.454	9.966
June	1.685	1.95	600.180	2132	797	+1335	+0.380	-1.505	-1.498	600.452
July	2.05	2.15	0.560	1387	797	+ 590	+0.168	-1.490	-1.476	0.674
Aug.	2.19	2.23	0.728	739	797	- 58	-0.016	-1.462		
Sept.	2.165	2.10	0.712	562	797					

TABLE 40.
EFFECT ON WATER LEVELS OF LAKE MICHIGAN-HURON, OF REGULATION OF LAKE SUPERIOR TO COMPENSATE FOR DIVERSION OF 4000 CUBIC FEET PER SECOND THROUGH CHICAGO DRAINAGE CANAL.

DATE.	WATER LEVELS OF LAKE MICHIGAN-HURON.		RISE OR FALL IN STAGE OF LAKE MICHIGAN-HURON DURING MONTH, IN FEET.	REGULATED LESS ACTUAL TRANSMITTED SUPPLY, 100 c.f.s.	NET CHANGE IN SUPPLY, <i>a</i> 100 c.f.s.	EFFECT OF NET CHANGE IN SUPPLY ON STAGE OF LAKE MICHIGAN-HURON, Foot Depth.	EFFECT OF CHANGE IN OUTFLOW THROUGH ST. CLAIR RIVER ON STAGE OF LAKE MICHIGAN-HURON, Foot Depth.	TOTAL EFFECT, NET CHANGE IN SUPPLY AND OUTFLOW ON STAGE OF LAKE MICHIGAN-HURON, Foot Depth.	REGULATED CONDITIONS			DISCHARGE INCREMENT OF ST. CLAIR RIVER PER FOOT RISE OF LAKE LEVEL, 100 c.f.s.	CHANGE IN OUTFLOW OF ST. CLAIR RIVER, 100 c.f.s.	REGULATED CONDITIONS, STAGE OF LAKE MICHIGAN-HURON, Mean of Month.	
	First of Month.	Mean of Month.							STAGE OF LAKE MICHIGAN-HURON, First of Month.	First of Month.	Mean of Month.				
1888	582.128	581.985	+0.152	-259	-299	-0.0609	0.0000	-0.0609	+0.091	582.128	0.000	-0.030	209	-6	582.240
May		2.270	-0.010	-295	-335	-0.0682	+0.0026	-0.0656	-0.076	2.219	-0.061	-0.094	209	-20	2.196
June	2.280	2.290	-0.130	-293	-333	-0.0678	+0.0055	-0.0623	-0.192	2.143	-0.127	-0.158	209	-33	2.092
July	2.270	2.250	-0.248	-275	-315	-0.0643	+0.0074	-0.0569	-0.305	1.951	-0.189	-0.218	191	-42	1.812
Aug.	2.140	2.030	-0.194	-272	-312	-0.0636	+0.0096	-0.0540	-0.248	1.646	-0.246	-0.273	191	-52	1.482
Sept.	1.892	1.755	-0.256	-226	-266	-0.0543	+0.0117	-0.0426	-0.299	1.398	-0.300	-0.322	191	-61	1.318
Oct.	1.698	1.640	-0.237	-81	-121	-0.0247	+0.0134	-0.0113	-0.248	1.099	-0.343	-0.348	191	-67	0.897
Nov.	1.442	1.245													
Dec.	1.245														
1889															
Jan.	1.205	1.165	-0.067	-25	-65	-0.0133	+0.0127	-0.0006	-0.068	0.851	-0.354	-0.354	175	-62	0.811
Feb.	1.138	1.110	-0.038	+33	-7	-0.0014	+0.0128	+0.0114	-0.027	0.783	-0.355	-0.350	175	-61	0.760
Mar.	1.100	1.090	-0.025	+27	-13	-0.0027	+0.0124	+0.0097	-0.015	0.756	-0.344	-0.339	175	-59	0.751
April	1.075	1.060	+0.040	+29	-11	-0.0022	+0.0120	+0.0098	+0.050	0.741	-0.334	-0.329	175	-58	0.731
May	1.115	1.170	+0.253	-83	-123	-0.0251	+0.0117	-0.0134	+0.240	0.791	-0.324	-0.330	175	-58	0.840
June	1.368	1.565	+0.307	-119	-159	-0.0324	+0.0131	-0.0193	+0.288	1.031	-0.337	-0.346	191	-66	1.219
July	1.675	1.785	+0.035	-173	-213	-0.0435	+0.0139	-0.0296	+0.005	1.319	-0.356	-0.371	191	-71	1.414
Aug.	1.710	1.635	-0.160	-175	-215	-0.0439	+0.0151	-0.0288	-0.189	1.324	-0.386	-0.400	191	-76	1.235
Sept.	1.550	1.465	-0.240	-173	-213	-0.0435	+0.0162	-0.0273	-0.267	1.135	-0.415	-0.428	191	-82	1.037
Oct.	1.310	1.155	-0.328	-143	-183	-0.0374	+0.0159	-0.0215	-0.350	0.868	-0.442	-0.453	175	-79	0.702
Nov.	0.982	0.810	-0.257	-83	-123	-0.0251	+0.0167	-0.0084	-0.265	0.518	-0.464	-0.468	175	-82	0.342
Dec.	0.725	0.640	-0.047	-7	-47	-0.0096	+0.0170	+0.0074	-0.040	0.253	-0.472	-0.468	175	-82	0.172
1890															
Jan.	0.678	0.715	-0.003	-17	-57	-0.0116	+0.0167	+0.0051	+0.002	0.213	-0.465	-0.462	175	-81	0.253
Feb.	0.675	0.635	-0.050	+93	+53	+0.0108	+0.0166	+0.0274	-0.023	0.215	-0.460	-0.446	175	-78	0.189
Mar.	0.625	0.615	+0.105	+95	+55	+0.0112	+0.0156	+0.0268	+0.132	0.192	-0.433	-0.420	175	-73	0.195
April	0.730	0.845	+0.250	+109	+69	+0.0141	+0.0146	+0.0287	+0.279	0.324	-0.406	-0.392	175	-69	0.453
May	0.980	1.115	+0.345	+15	-25	-0.0051	+0.0136	+0.0085	+0.353	0.603	-0.377	-0.373	175	-65	0.742
June	1.325	1.535	+0.275	-101	-141	-0.0288	+0.0133	-0.0155	+0.259	0.956	-0.369	-0.377	175	-66	1.158
July	1.600	1.665	+0.045	-173	-213	-0.0435	+0.0150	-0.0285	+0.017	1.215	-0.385	-0.399	191	-76	1.266
Aug.	1.645	1.625	-0.137	-155	-195	-0.0398	+0.0161	-0.0237	-0.161	1.232	-0.413	-0.425	191	-81	1.200
Sept.	1.508	1.390	-0.198	-133	-173	-0.0353	+0.0170	-0.0183	-0.216	1.071	-0.437	-0.446	191	-85	0.944
Oct.	1.310	1.230	-0.215	-119	-159	-0.0325	+0.0164	-0.0161	-0.231	0.855	-0.455	-0.463	175	-81	0.767
Nov.	1.095	0.960	-0.297	-91	-131	-0.0268	+0.0170	-0.0098	-0.307	0.624	-0.471	-0.476	175	-83	0.484
Dec.	0.798	0.635	-0.218	-31	-71	-0.0145	+0.0173	+0.0028	-0.215	0.317	-0.481	-0.480	175	-84	0.155

a. —Net change=regulated transmitted supply from Lake Superior—diversion through Chicago Drainage Canal—actual transmitted supply from Lake Superior.
Regulated transmitted supply from Lake Superior, with diversion through Chicago Drainage Canal of 4000 c.f.s.=65700 c.f.s.+0000 c.f.s.=69700 c.f.s.

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1891	580.580	580.525	-0.142	+107	+67	+0.0137	+0.0172	+0.0309	-0.111	580.102	-0.478	-0.462	175	-81	580.063
Jan.	0.438	0.350	-0.048	+85	+45	+0.0092	+0.0148	+0.0240	-0.024	579.991	-0.447	-0.435	163	-71	579.915
Feb.	0.390	0.430	+0.200	+115	+75	+0.0153	+0.0140	+0.0293	+0.229	9.967	-0.423	-0.408	163	-67	580.022
Mar.	0.590	0.750	+0.245	+79	+39	+0.0080	+0.0142	+0.0222	+0.267	580.196	-0.394	-0.383	175	-67	0.367
April	0.835	0.920	+0.110	-7	-47	-0.0096	+0.0134	+0.0038	+0.114	0.463	-0.372	-0.370	175	-65	0.550
May	0.945	0.970	-0.010	+3	-37	-0.0076	+0.0132	+0.0057	-0.004	0.577	-0.368	-0.365	175	-64	0.605
June	0.935	0.900	-0.077	-19	-59	-0.0121	+0.0130	+0.0009	-0.076	0.573	-0.362	-0.362	175	-63	0.538
July	0.858	0.815	-0.148	-21	-61	-0.0125	+0.0130	+0.0005	-0.147	0.497	-0.361	-0.360	175	-63	0.455
Aug.	0.710	0.605	-0.288	-7	-47	-0.0096	+0.0130	+0.0034	-0.285	0.350	-0.360	-0.358	175	-63	0.247
Sept.	0.422	0.240	-0.360	-19	-59	-0.0121	+0.0129	+0.0008	-0.359	0.065	-0.357	-0.356	175	-62	579.884
Oct.	0.062	579.885	-0.207	+3	-37	-0.0076	+0.0117	+0.0041	-0.203	579.706	-0.356	-0.354	163	-58	9.531
Nov.	579.855	9.825	+0.005	+65	+25	+0.0051	+0.0116	+0.0167	+0.022	9.503	-0.352	-0.344	163	-56	9.481
Dec.															
1892															
Jan.	9.860	9.895	+0.068	+77	+37	+0.0076	+0.0111	+0.0187	+0.087	9.525	-0.335	-0.326	163	-53	9.569
Feb.	9.928	9.960	+0.022	+149	+109	+0.0223	+0.0104	+0.0327	+0.055	9.612	-0.316	-0.300	163	-49	9.660
Mar.	9.950	9.940	+0.035	+185	+145	+0.0297	+0.0093	+0.0390	+0.074	9.667	-0.283	-0.264	163	-43	9.676
April	9.985	580.030	+0.173	+153	+113	+0.0231	+0.0081	+0.0312	+0.204	9.741	-0.244	-0.228	163	-37	9.802
May	580.158	0.285	+0.372	+51	+11	+0.0023	+0.0070	+0.0093	+0.381	9.945	-0.213	-0.208	163	-34	580.077
June	0.530	0.775	+0.320	-21	-61	-0.0125	+0.0073	-0.0052	+0.315	580.326	-0.204	-0.206	175	-36	0.569
July	0.850	0.925	+0.115	-49	-89	-0.0182	+0.0075	-0.0107	+0.104	0.641	-0.209	-0.214	175	-38	0.711
Aug.	0.965	1.005	-0.053	-51	-91	-0.0186	+0.0079	-0.0107	-0.064	0.745	-0.220	-0.225	175	-39	0.779
Sept.	0.912	0.820	-0.204	-63	-103	-0.0210	+0.0083	-0.0127	-0.217	0.681	-0.231	-0.238	175	-42	0.582
Oct.	0.708	0.595	-0.263	-41	-81	-0.0165	+0.0088	-0.0077	-0.271	0.464	-0.244	-0.248	175	-43	0.347
Nov.	0.445	0.295	-0.277	+15	-25	-0.0051	+0.0091	+0.0040	-0.273	0.193	-0.252	-0.250	175	-44	0.045
Dec.	0.168	0.010	-0.193	+71	+31	+0.0063	+0.0082	+0.0145	-0.179	579.920	-0.248	-0.241	163	-39	579.799
1893															
Jan.	579.975	579.910	-0.043	+178	+138	+0.0282	+0.0077	+0.0359	-0.007	9.741	-0.234	-0.216	163	-35	9.694
Feb.	9.932	9.955	+0.070	+215	+175	+0.0358	+0.0065	+0.0423	+0.112	9.734	-0.198	-0.177	163	-29	9.778
Mar.	580.002	580.050	+0.258	+213	+173	+0.0354	+0.0051	+0.0405	+0.298	9.846	-0.156	-0.136	163	-22	9.914
April	0.260	0.470	+0.442	+166	+126	+0.0257	+0.0042	+0.0299	+0.472	580.144	-0.116	-0.101	175	-18	580.369
May	0.702	0.935	+0.398	+59	+19	+0.0039	+0.0031	+0.0070	+0.405	0.616	-0.086	-0.082	175	-14	0.853
June	1.100	1.265	+0.205	-41	-81	-0.0165	+0.0031	-0.0134	+0.192	1.021	-0.079	-0.085	191	-15	1.179
July	1.305	1.345	-0.037	-78	-118	-0.0241	+0.0036	-0.0205	-0.057	1.213	-0.092	-0.102	191	-18	1.243
Aug.	1.268	1.190	-0.233	-93	-133	-0.0271	+0.0044	-0.0027	-0.256	1.156	-0.112	-0.124	191	-24	1.066

a.--Net change=regulated transmitted supply from Lake Superior--diversion through Chicago Drainage Canal--actual transmitted supply from Lake Superior.
Regulated transmitted supply from Lake Superior, with diversion through Chicago Drainage Canal of 4000 c.f.s.=65700 c.f.s.+4000 c.f.s.=69700 c.f.s.

TABLE 41.
EFFECT ON WATER LEVELS OF LAKE ERIE, OF REGULATION OF LAKE SUPERIOR, TO COMPENSATE
FOR DIVERSION OF 4000 CUBIC FEET PER SECOND THROUGH CHICAGO DRAINAGE CANAL.

DATE.	WATER LEVELS OF LAKE ERIE AT CLEVELAND, O.		RISE OR FALL IN STAGE OF LAKE ERIE, DURING MONTH,	NET CHANGE IN TRANS- MITTED SUPPLY, 100 c.f.s.	EFFECT OF NET CHANGE IN TRANS- MITTED SUPPLY, ON STAGE OF LAKE ERIE, Foot Depth.	EFFECT OF CHANGE IN OUTFLOW THROUGH NIAGARA RIVER ON STAGE OF LAKE ERIE, Foot Depth.	TOTAL EFFECT NET CHANGE TRANS- MITTED SUPPLY AND OUTFLOW, ON STAGE OF LAKE ERIE, Foot Depth.	REGULATED CONDITIONS.		REGULATED STAGE LESS ACTUAL STAGE OF LAKE ERIE.		DISCHARGE INCRE- MENT OF NIAGARA RIVER PER FOOT RISE OF LAKE LEVEL. 100 c.f.s.	CHANGE IN OUTFLOW OF NIAGARA RIVER, 100 c.f.s.	REGU- LATED CON- DITIONS, STAGE OF LAKE ERIE, Mean of Month.
	First of Month.	Mean of Month.	In Feet.					RISE OR FALL IN STAGE OF LAKE ERIE, DURING MONTH, In Feet.	STAGE OF LAKE ERIE, First of Month.	First of Month.	Mean of Month.			
1888														
May	573.04	572.98	+0.14	-6	-0.0051	0.0000	-0.0051	+0.135	573.040	0.000	-0.002	251	-1	573.108
June	3.11	3.11	+0.03	-20	-0.0169	+0.0010	-0.0159	+0.014	3.175	-0.005	-0.013	251	-3	3.247
July	3.26	3.26	-0.27	-33	-0.0279	+0.0040	-0.0239	-0.294	3.189	-0.021	-0.033	251	-8	3.127
Aug.	3.21	3.16	-0.40	-42	-0.0358	+0.0081	-0.0277	-0.428	2.895	-0.045	-0.059	232	-14	2.661
Sept.	2.94	2.72	-0.16	-52	-0.0443	+0.0131	-0.0312	-0.191	2.467	-0.073	-0.088	232	-20	2.262
Oct.	2.54	2.35	-0.03	-61	-0.0520	+0.0187	-0.0333	-0.063	2.276	-0.104	0.120	232	-28	2.290
Nov.	2.38	2.41	-0.05	-67	-0.0571	+0.0247	-0.0324	-0.082	2.213	-0.137	-0.153	232	-35	2.137
Dec.	2.35	2.29												
1889														
Jan.	2.36	2.31	-0.07	-62	-0.0529	+0.0304	-0.0225	-0.092	2.131	-0.169	-0.180	232	-42	2.130
Feb.	2.23	2.15	-0.16	-61	-0.0520	+0.0344	-0.0176	-0.178	2.039	-0.191	-0.200	214	-43	1.950
Mar.	2.07	1.99	+0.09	-59	-0.0507	+0.0351	-0.0156	+0.074	1.861	-0.209	-0.217	214	-46	1.773
April	2.16	2.34	+0.27	-58	-0.0498	+0.0378	-0.0120	+0.258	1.935	-0.225	-0.231	232	-54	2.109
May	2.43	2.52	+0.31	-58	-0.0494	+0.0427	-0.0067	+0.303	2.193	-0.237	-0.240	232	-56	2.280
June	2.74	2.95	+0.31	-66	-0.0563	+0.0439	-0.0124	+0.298	2.496	-0.244	-0.250	232	-58	2.700
July	3.05	3.15	-0.05	-71	-0.0605	+0.0461	-0.0144	-0.064	2.794	-0.256	-0.263	232	-61	2.887
Aug.	3.00	2.84	-0.36	-76	-0.0648	+0.0486	-0.0162	-0.376	2.730	-0.270	-0.278	232	-64	2.562
Sept.	2.64	2.45	-0.40	-82	-0.0699	+0.0515	-0.0184	-0.418	2.354	-0.286	-0.295	232	-68	2.155
Oct.	2.24	2.03	-0.34	-79	-0.0679	+0.0511	-0.0168	-0.357	1.936	-0.304	-0.312	214	-67	1.718
Nov.	1.90	1.76	-0.01	-82	-0.0704	+0.0539	-0.0165	-0.026	1.579	-0.321	-0.329	214	-70	1.431
Dec.	1.89	2.02	+0.31	-82	-0.0704	+0.0566	-0.0138	+0.296	1.553	-0.337	-0.344	214	-74	1.676
1890														
Jan.	2.20	2.38	+0.32	-81	-0.0696	+0.0590	-0.0106	+0.309	1.849	-0.351	-0.356	232	-83	2.024
Feb.	2.52	2.67	+0.21	-78	-0.0665	+0.0652	-0.0013	+0.209	2.158	-0.362	-0.362	232	-84	2.308
Mar.	2.73	2.79	+0.31	-73	-0.0622	+0.0653	+0.0031	+0.313	2.367	-0.363	-0.362	232	-84	2.428
April	3.04	3.28	+0.41	-69	-0.0588	+0.0648	+0.0060	+0.416	2.680	-0.360	-0.357	232	-83	2.923
May	3.45	3.62	+0.35	-65	-0.0549	+0.0680	+0.0131	+0.363	3.096	-0.354	-0.348	251	-87	3.272
June	3.80	3.99	0.00	-66	-0.0558	+0.0655	+0.0097	+0.010	3.459	-0.341	-0.336	251	-84	3.654
July	3.80	3.61	-0.42	-76	-0.0642	+0.0636	-0.0006	-0.421	3.469	-0.331	-0.332	251	-83	3.278
Aug.	3.38	3.15	-0.32	-81	-0.0685	+0.0637	-0.0048	-0.325	3.048	-0.332	-0.334	232	-77	2.816
Sept.	3.06	2.98	-0.18	-85	-0.0725	+0.0607	-0.0118	-0.192	2.723	-0.337	-0.343	232	-80	2.637
Oct.	2.88	2.79	-0.10	-81	-0.0691	+0.0628	-0.0063	-0.106	2.531	-0.349	-0.352	232	-82	2.438
Nov.	2.78	2.76	-0.14	-83	-0.0708	+0.0639	-0.0069	-0.147	2.425	-0.355	-0.358	232	-83	2.402
Dec.	2.64	2.53	-0.22	-84	-0.0716	+0.0652	-0.0064	-0.226	2.278	-0.362	-0.365	232	-85	2.165

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1891	572.42	572.31	-0.12	-81	-0.0691	+0.0662	-0.0029	-0.123	572.052	-0.368	-0.370	214	-79	571.940
Jan.			+0.22	-71	-0.0610	+0.0623	+0.0013	+0.221	1.929	-0.371	-0.370	214	-79	1.920
Feb.	2.30	2.29	+0.16	-67	-0.0571	+0.0666	+0.0095	+0.170	2.150	-0.370	-0.365	232	-85	2.385
Mar.	2.52	2.75	-0.15	-67	-0.0571	+0.0648	+0.0077	-0.142	2.320	-0.360	-0.356	232	-83	2.264
April	2.68	2.62	-0.02	-65	-0.0554	+0.0634	+0.0080	-0.012	2.178	-0.352	-0.348	232	-81	2.092
May	2.53	2.44	+0.02	-64	-0.0546	+0.0619	+0.0073	+0.027	2.166	-0.344	-0.340	232	-79	2.240
June	2.51	2.58	+0.02	-63	-0.0537	+0.0607	+0.0070	-0.183	2.193	-0.337	-0.334	232	-77	2.146
July	2.53	2.48	-0.19	-63	-0.0537	+0.0594	+0.0057	-0.214	2.010	-0.330	-0.327	314	-70	1.883
Aug.	2.34	2.21	-0.22	-63	-0.0541	+0.0544	+0.0003	-0.280	1.796	-0.324	-0.324	214	-69	1.706
Sept.	2.12	2.03	-0.28	-62	-0.0533	+0.0544	+0.0011	-0.409	1.516	-0.324	-0.324	214	-69	1.326
Oct.	1.84	1.65	-0.41	-58	-0.0498	+0.0543	+0.0045	-0.186	1.107	-0.323	-0.321	196	-63	0.889
Nov.	1.43	1.21	-0.19	-56	-0.0485	+0.0501	+0.0016	+0.062	0.921	-0.319	-0.318	196	-62	0.962
Dec.	1.24	1.28	+0.06											
1892														
Jan.	1.30	1.31	-0.10	-53	-0.0459	+0.0498	+0.0039	-0.096	0.983	-0.317	-0.315	196	-62	0.995
Feb.	1.20	1.10	-0.08	-49	-0.0424	+0.0491	+0.0067	-0.073	0.887	-0.313	-0.310	196	-61	0.790
Mar.	1.12	1.14	+0.30	-43	+0.0372	+0.0480	+0.0108	+0.311	0.814	-0.306	-0.300	196	-59	0.840
April	1.42	1.70	+0.68	-37	-0.0318	+0.0496	+0.0178	+0.698	1.125	-0.295	-0.286	214	-61	1.414
May	2.10	2.50	+0.78	-34	-0.0292	+0.0465	+0.0173	+0.797	1.823	-0.277	-0.268	232	-62	2.232
June	2.88	3.26	+0.44	-36	-0.0307	+0.0468	+0.0161	+0.456	2.620	-0.260	-0.252	251	-63	3.008
July	3.32	3.38	-0.12	-38	-0.0321	+0.0468	+0.0147	-0.105	3.076	-0.244	-0.236	251	-59	3.144
Aug.	3.20	3.03	-0.13	-39	-0.0332	+0.0412	+0.0080	-0.322	2.971	-0.229	-0.225	232	-52	2.805
Sept.	2.87	2.71	-0.44	-42	-0.0358	+0.0398	+0.0040	-0.436	2.649	-0.221	-0.219	232	-51	2.491
Oct.	2.43	2.15	-0.45	-43	-0.0367	+0.0391	+0.0024	-0.448	2.213	-0.217	-0.216	214	-46	1.934
Nov.	1.98	1.82	-0.30	-44	-0.0378	+0.0361	-0.0017	-0.302	1.765	-0.215	-0.216	214	-56	1.604
Dec.	1.68	1.55	-0.32	-39	-0.0335	+0.0365	+0.0030	-0.317	1.463	-0.217	-0.216	214	-46	1.334
1893														
Jan.	1.36	1.17	-0.15	-35	-0.0301	-0.0360	+0.0059	-0.144	1.146	-0.214	-0.214	196	-41	0.959
Feb.	1.21	1.25	+0.15	-29	-0.0249	+0.0349	+0.0100	+0.160	1.002	-0.208	-0.203	214	-43	1.047
Mar.	1.36	1.47	+0.48	-22	-0.0189	+0.0333	+0.0144	+0.494	1.162	-0.198	-0.191	214	-41	1.279
April	1.84	2.20	+0.78	-18	-0.0155	+0.0309	+0.0154	+0.795	1.656	-0.184	-0.176	232	-41	2.024
May	2.62	3.04	+0.52	-14	-0.0119	+0.0304	+0.0185	+0.538	2.451	-0.169	-0.160	232	-37	2.880
June	3.14	3.23	-0.05	-15	-0.0128	+0.0272	+0.0144	-0.036	2.989	-0.151	-0.144	251	-36	3.086
July	3.09	2.95	-0.31	-18	-0.0153	+0.0247	+0.0094	-0.301	2.953	-0.137	-0.132	232	-31	2.818
Aug.	2.78	2.61	-0.36	-24	-0.0205	+0.0230	+0.0025	-0.358	2.652	-0.128	-0.127	232	-29	2.483
Sept.	2.42	2.23	-0.36						2.294	-0.126				

TABLE 42.
EFFECT ON WATER LEVELS OF LAKE ONTARIO, OF REGULATION OF LAKE SUPERIOR, TO COMPENSATE
FOR DIVERSION OF 4000 CUBIC FEET PER SECOND THROUGH CHICAGO DRAINAGE CANAL.

DATE.	WATER LEVELS OF LAKE ONTARIO AT OSWEGO, N.Y.		RISE OR FALL IN STAGE OF LAKE ONTARIO DURING MONTH, In Feet.	NET CHANGE IN TRANS- MITTED SUPPLY, 100 c.f.s.	EFFECT OF NET CHANGE IN TRANS- MITTED SUPPLY ON STAGE OF LAKE ONTARIO, Foot Depth.	EFFECT OF CHANGE IN OUTFLOW THROUGH ST. LAWRENCE RIVER ON STAGE OF LAKE ONTARIO, Foot Depth.	TOTAL EFFECT, NET CHANGE IN TRANS- MITTED SUPPLY AND OUTFLOW, ON STAGE OF LAKE ONTARIO, Foot Depth.	REGULATED CONDITIONS.		REGULATED STAGE LESS ACTUAL STAGE OF LAKE ONTARIO,		REGULATED CONDITIONS, STAGE OF LAKE ONTARIO,
	First of Month.	Mean of Month.						RISE OF FALL IN STAGE OF LAKE ONTARIO, DURING MONTH, In Feet.	STAGE OF LAKE ONTARIO, First of Month.	First of Month.	Mean of Month.	
1888												
May	246.26	246.24	+0.05	- 1	-0.0011	0.0000	-0.0011	+0.049	246.260	0.000	0.000	246.280
June	6.31	6.28	-0.02	- 3	-0.0033	+0.0003	-0.0030	-0.023	6.309	-0.001	-0.002	6.338
July	6.29	6.34	-0.25	- 8	-0.0088	+0.0013	-0.0075	-0.258	6.286	-0.004	-0.008	6.232
Aug.	6.04	6.24	-0.37	-14	-0.0153	+0.0038	-0.0115	-0.382	6.028	-0.012	-0.018	5.832
Sept.	5.67	5.85	-0.21	-20	-0.0220	+0.0074	-0.0146	-0.225	5.646	-0.024	-0.032	5.458
Oct.	5.46	5.49	-0.04	-28	-0.0308	+0.0120	-0.0188	-0.059	5.421	-0.039	-0.048	5.372
Nov.	5.42	5.42	+0.10	-35	-0.0385	+0.0179	-0.0206	+0.079	5.362	-0.058	-0.068	5.342
Dec.												
1889												
Jan.	5.52	5.62	+0.17	-42	-0.0463	+0.0243	-0.0220	+0.148	5.441	-0.079	-0.090	5.530
Feb.	5.69	5.76	+0.15	-43	-0.0474	+0.0311	-0.0163	+0.134	5.589	-0.101	-0.109	5.651
Mar.	5.84	5.93	+0.21	-46	-0.0507	+0.0360	-0.0147	+0.195	5.723	-0.117	-0.124	5.806
April	6.05	6.17	+0.19	-54	-0.0595	+0.0407	-0.0188	+0.171	5.918	-0.132	-0.142	6.028
May	6.24	6.32	+0.24	-56	-0.0613	+0.0480	-0.0133	+0.227	6.089	-0.151	-0.158	6.162
June	6.48	6.63	+0.24	-58	-0.0635	+0.0522	-0.0113	+0.229	6.316	-0.164	-0.170	6.460
July	6.72	6.82	-0.02	-61	-0.0668	+0.0556	-0.0112	-0.031	6.545	-0.175	-0.180	6.640
Aug.	6.70	6.57	-0.41	-64	-0.0701	+0.0591	-0.0110	-0.421	6.514	-0.186	-0.192	6.378
Sept.	6.29	6.01	-0.50	-68	-0.0745	+0.0626	-0.0119	-0.512	6.093	-0.197	-0.203	5.807
Oct.	5.79	5.57	-0.42	-67	-0.0738	+0.0644	-0.0094	-0.429	5.581	-0.209	-0.214	5.356
Nov.	5.37	5.17	+0.09	-70	-0.0771	+0.0671	-0.0100	+0.080	5.152	-0.218	-0.223	4.947
Dec.	5.46	5.74	+0.54	-74	-0.0815	+0.0702	-0.0113	+0.529	5.232	-0.228	-0.234	5.506
1890												
Jan.	6.00	6.25	+0.42	-83	-0.0914	+0.0736	-0.0178	+0.402	5.761	-0.239	-0.248	6.002
Feb.	6.42	6.60	+0.34	-84	-0.0920	+0.0817	-0.0103	+0.330	6.163	-0.257	-0.262	6.338
Mar.	6.76	6.93	+0.29	-84	-0.0920	+0.0849	-0.0071	+0.283	6.493	-0.267	-0.270	6.660
April	7.05	7.17	+0.30	-83	-0.0909	+0.0871	-0.0038	+0.296	6.776	-0.274	-0.276	6.894
May	7.35	7.53	+0.49	-87	-0.0948	+0.0909	-0.0039	+0.486	7.072	-0.278	-0.280	7.250
June	7.84	8.16	+0.24	-84	-0.0915	+0.0922	+0.0007	+0.241	7.558	-0.282	-0.282	7.878
July	8.08	7.99	-0.42	-83	-0.0904	+0.0919	+0.0015	-0.418	7.799	-0.281	-0.280	7.710
Aug.	7.66	7.32	-0.52	-77	-0.0839	+0.0912	+0.0073	-0.513	7.381	-0.279	-0.276	7.044
Sept.	7.14	6.97	-0.34	-80	-0.0876	+0.0865	-0.0011	-0.341	6.868	-0.272	-0.272	6.698
Oct.	6.80	6.64	-0.12	-82	-0.0898	+0.0868	-0.0030	-0.123	6.527	-0.273	-0.274	6.366
Nov.	6.68	6.72	-0.06	-83	-0.0909	+0.0878	-0.0031	-0.063	6.404	-0.276	-0.278	6.442
Dec.	6.62	6.51	-0.27	-85	-0.0931	+0.0887	-0.0044	-0.274	6.341	-0.279	-0.281	6.229

SESSIONAL PAPER No. 54.

1891	246.35	246.19	-0.03	-79	-0.0865	+0.0900	+0.0035	-0.026	246.067	-0.283	-0.281	245.909
Jan.	6.32	6.45	+0.40	-79	-0.0865	+0.0887	+0.0022	+0.402	6.041	-0.279	-0.278	6.172
Feb.	6.72	6.99	+0.51	-85	-0.0931	+0.0881	-0.0050	+0.505	6.443	-0.277	-0.280	6.710
Mar.	7.23	7.47	+0.13	-83	-0.0909	+0.0897	-0.0012	+0.129	6.948	-0.282	-0.282	7.188
April	7.36	7.25	-0.32	-81	-0.0882	+0.0925	+0.0043	-0.316	7.077	-0.283	-0.281	6.969
May	7.04	6.83	-0.35	-79	-0.0865	+0.0887	+0.0022	-0.348	6.761	-0.279	-0.278	6.552
June	6.69	6.55	-0.36	-77	-0.0843	+0.0881	+0.0038	-0.356	6.413	-0.277	-0.275	6.275
July	6.33	6.11	-0.43	-70	-0.0767	+0.0868	+0.0101	-0.420	6.057	-0.273	-0.268	5.842
Aug.	5.90	5.68	-0.54	-69	-0.0760	+0.0810	+0.0050	-0.535	5.637	-0.263	-0.260	5.420
Sept.	5.36	5.04	-0.62	-69	-0.0760	+0.0795	+0.0035	-0.616	5.102	-0.258	-0.256	4.784
Oct.	4.74	4.44	-0.32	-63	-0.0698	+0.0759	+0.0061	-0.314	4.486	-0.254	-0.251	4.189
Nov.	4.42	4.41	+0.04	-62	-0.0687	+0.0742	+0.0055	+0.046	4.172	-0.248	-0.245	4.162
Dec.	4.46	4.51	+0.04	-62	-0.0687	+0.0724	+0.0037	+0.044	4.218	-0.242	-0.240	4.270
1892	4.50	4.48	+0.04	-61	-0.0676	+0.0712	+0.0036	+0.044	4.262	-0.238	-0.236	4.244
Jan.	4.54	4.61	+0.36	-59	-0.0653	+0.0700	+0.0047	+0.365	4.306	-0.234	-0.232	4.378
Feb.	4.90	5.19	+0.32	-61	-0.0676	+0.0685	+0.0009	+0.321	4.671	-0.229	-0.228	4.962
Mar.	5.22	5.25	+0.31	-62	-0.0687	+0.0682	-0.0005	+0.310	4.992	-0.228	-0.228	5.022
April	5.53	5.81	+0.53	-63	-0.0694	+0.0702	+0.0008	+0.531	5.302	-0.228	-0.228	5.582
May	6.06	6.32	+0.22	-59	-0.0650	+0.0699	+0.0049	+0.225	6.833	-0.227	-0.224	6.096
June	6.28	6.24	-0.14	-52	-0.0570	+0.0706	+0.0136	-0.126	6.058	-0.222	-0.215	6.025
July	6.14	6.04	-0.32	-51	-0.0562	+0.0641	+0.0079	-0.312	5.932	-0.208	-0.204	5.836
Aug.	5.82	5.60	-0.36	-46	-0.0507	+0.0616	+0.0109	-0.349	5.620	-0.200	-0.194	5.406
Sept.	5.46	5.33	-0.20	-46	-0.0507	+0.0582	+0.0075	-0.192	5.271	-0.189	-0.185	5.145
Oct.	5.26	5.20	-0.22	-46	-0.0507	+0.0557	+0.0050	-0.215	5.079	-0.181	-0.178	5.022
Nov.	5.04	4.87	-0.22	-41	-0.0454	+0.0526	+0.0072	-0.213	4.864	-0.176	-0.172	4.698
Dec.	4.82	4.76	+0.18	-43	-0.0476	+0.0505	+0.0029	+0.183	4.651	-0.169	-0.168	4.592
1893	5.00	5.24	+0.62	-41	-0.0454	+0.0496	+0.0042	+0.624	4.834	-0.166	-0.164	5.076
Jan.	5.62	5.99	+0.95	-41	-0.0452	+0.0499	+0.0047	+0.955	5.458	-0.162	-0.160	5.830
Feb.	6.57	7.15	+0.69	-37	-0.0405	+0.0499	+0.0094	+0.699	6.413	-0.157	-0.152	6.998
Mar.	7.26	7.37	-0.02	-36	-0.0392	+0.0484	+0.0092	-0.011	7.112	-0.148	-0.144	7.226
April	7.24	7.11	-0.40	-31	-0.0338	+0.0455	+0.0117	-0.388	7.101	-0.139	-0.133	6.977
May	6.84	6.57	-0.40	-29	-0.0318	+0.0404	+0.0086	-0.391	6.713	-0.127		

